In this session, we explore

- when to test, what to test and how to test Ajax components.
- creating automatic tests with various tools, including YUI Test, OpenQA Selenium, and TIBCO Test Automation Kit
- how to use Ajax testing tools with IDEs and continuous integration systems.
Ajax Testing Tool Review

when to test, what to test, how to test Ajax applications

Square One University Series
Ajax Testing Tool Review

For the latest version of this presentation, visit http://slideshare.com/ted.husted

For the latest version of source code, visit http://code.google.com/p/yazaar/
Abstract

Not long ago, testing Ajax components meant play-testing a page by hand.

Today, there are a growing number of tools we can use to simplify and automate Ajax testing.

During the session, we will cover

- when, what, and how to test Ajax applications
- creating automatic tests with various tools
- testing with IDEs and continuous Integration systems
Ajax Testing Tool Review

Tool Review
- JsUnit and YUI Test
- Selenium
- Cruise Control

Ajax Testing in Action
- Live Coding Demonstration
  - YUI Test + Selenium + Cruise Control
  - Added value: MyEclipse and IDEA
JsUnit

- JsUnit is a Unit Testing framework for client-side (in-browser) JavaScript.
- Essentially a port of JUnit to JavaScript.
- Platform for automating the execution of tests on multiple browsers and multiple machines running different OSs.
JsUnit – Key Features

- Create test cases with JavaScript code.
- Tracing modes - warn, info, and debug.
- Group related cases using test suites.
- Server component
  - provide integration with other test platforms,
  - test logging, and
  - running tests on multiple target platforms.
JsUnit – Key Features

- Browser Support - Internet Explorer 5.0+, Firefox or Mozilla 0.9+, Netscape 6.0+, and Konqueror 5+.
- Release - 2.2 (Alpha, 2006 March)
  - 2.2.0 (tagged 2008 Jan)
  - Since 2001
- License - GPL, LGPL, MPL
- One team member
Introduction

JsUnit is a Unit Testing framework for client-side (in-browser) JavaScript. It is essentially a port of JUnit to JavaScript. Also included is a platform for automating the execution of tests on multiple browsers and multiple machines running different OSs. Its development began in January 2001.

- The central area for discussion of JsUnit is a mailing list/posting area hosted by Yahoo (founded 5/17/2001). To join click here.
- If you would rather email me with questions, suggestions, problems, etc., my address for JsUnit-related correspondence is edward@jsunit.net.
- Please submit bugs to the SourceForge bug tracker, and feature ideas/patches to the mailing list.
- There is a high-level PowerPoint introduction to JsUnit here.
- JsUnit merchandise now available at agilestuff.com.

JsUnit is an Open Source project. It is distributed under the following licenses (download the distribution for more details): GNU Public License 2.0, GNU Lesser Public License 2.1, Mozilla Public License 1.1

JsUnit's development is hosted on SourceForge.

Notes

- It is assumed in these pages that the reader is familiar with JUnit or another of the XUnit frameworks. Where in the documentation there is a similar concept to one in JUnit it is noted.
- JsUnit uses exception handling, which means we need JavaScript 1.4 or higher. That means that the browsers supported are Internet Explorer 5.0 or later, Netscape 6.0 or later, Mozilla 0.9 or later, and Konqueror 5.0 or later. The latest version of JsUnit has been tested for:
  - IE 5.5+, on Windows NT, Windows 2000, Windows XP, Windows 95, Mac OS 9, Mac OS X
  - IE 5.0+ on Mac OS 9 and Mac OS X
  - Mozilla 0.9.4+ on all platforms (includes all Gecko-based browsers including Firefox 0.9+, Netscape 6.2.3+)
  - Konqueror 5+ on KDE 3.0.1 (Linux)
- If you have used JsUnit on other browser/platform combinations, please let me know of your findings.
- To run the server component of JsUnit, you will need a Java VM.

http://jsunit.net/
JsUnit 2.2 TestRunner
Running on Mozilla/5.0 (Windows U; Windows NT 5.2; en-US; rv:1.8.1.16) Gecko/20080702 Firefox/2.0.0.16

http://www.jsunit.net/runner/tests/jsUnitTestSuite.html

Trace level: no tracing  Close old trace window on new run  Page load timeout: 120  Setup page timeout: 120

Status: (Idle)
Progress:

Runs: 0  Errors: 0  Failures: 0

Errors and failures:

Show selected  Show all
JsUnit 2.2 TestRunner
Running on Mozilla/5.0 (Windows; U; Windows NT 5.2; en-US; rv:1.8.1.16) Gecko/20080702 Firefox/2.0.0.16

http://www.jsunit.net/runner/tests/jsUnitTestSuite.html

Trace level: no tracing  Close old trace window on new run  Page load timeout: 120  Setup page timeout: 120

Status: Done (5.484 seconds)
Progress: 
Runs: 71  Errors: 0  Failures: 0

Errors and failures:
Show selected  Show all

JsUnit 2.0 TestRunner
Running on Mozilla/4.0 (compatible; MSIE 6.0; Windows NT 5.1)

Enter the filename of the Test Page to be run:

file:///C:/jsunit/tests/multiplyAndAddFiveTest.html

Trace level: no tracing

- Close old trace window on new run

Page load timeout: 20
Setup page timeout: 60

Status: Done (0.491 seconds)

Progress:

Runs: 4 Errors: 0 Failures: 2

Errors and failures:

file:///C:/jsunit/tests/multiplyAndAddFiveTest.html/testWithInvalidArgs failed
file:///C:/jsunit/tests/multiplyAndAddFiveTest.html/testWithUndefinedValue failed

Show selected Show all

Microsoft Internet Explorer

"A null argument should result in null"
Expected null but was 5

Stack trace follows:
- JsUnitException
- _assert
- assertNull
- testWithInvalidArgs

OK
Assertion Functions

Test functions in a test page set up as described are then free to use the following functions. In each case but the last the comment argument is optional.

- `assert([comment], booleanValue)`
- `assertTrue([comment], booleanValue)`
- `assertFalse([comment], booleanValue)`
- `assertEquals([comment], value1, value2)`
- `assertNotEquals([comment], value1, value2)`
- `assertNull([comment], value)`
- `assertNotNull([comment], value)`
- `assertUndefined([comment], value)`
- `assertNotUndefined([comment], value)`
- `isNaN([comment], value)`
- `assertNaN([comment], value)`
- `fail([comment])`

Also, as a convenience, JsUnit provides a variable called `JSUNIT_UNDEFINED_VALUE` which is the JavaScript undefined value.

Note that JsUnit comes with several Test Pages (tests/jsUnitAssertionTests.html and tests/jsUnitUtilityTests.html) which test all of these test functions and other functions that the TestRunner uses.
| Activity within 7 days: | 2 New Members - 2 New Messages |

**Description**

Group for discussion of JsUnit

---

**Most Recent Messages** *(View All)* *(Group by Topic)*

| Re: Is 2.2.0 Final posted for download? | Edward Heat:
edwardheat |
| It's not posted yet. Grab the tag for now. | edwardheat |
| Posted - Sun Aug 17, 2008 6:49 pm | Offline |
| | Send Email |

| Is 2.2.0 Final posted for download? | Ted Husted:
ted_husted |
| At the SourceForge site, the only download listed seems to be 2.2Alpha from 2006 March. * https://sourceforge.net/project/showfiles.php?group_id=28041 | ted_husted |
| Posted - Sun Aug 17, 2008 6:47 pm | Offline |
| | Send Email |

| Re: CruiseControl with JsUnit | Jonny Leroy:
jonny_jercy |
| Try invoking cruisecontrol from the command line rather than as a service. I seem to remember a similar work-around for getting it to run Watir (a Ruby-based | jonny_jercy |
| Posted - Thu Aug 7, 2008 11:17 pm | Offline |
| | Send Email |

| Re: CruiseControl with JsUnit | deo_jaiswal |
| I set the timeout for 70 secs but its still timing out. Do you know if I am missing something here. Cruisecontrol runs as window service. Any setting I have to | deo_jaiswal |
| Posted - Thu Aug 7, 2008 11:20 am | Offline |
| | Send Email |

| Re: CruiseControl with JsUnit | kristianras |
| ... You could try to increase the property timeoutSeconds in the build.xml. Default I think it is 60 seconds. But it could be set to 30? | kristianras |
| | Offline |
| | Send Email |

---

http://tech.groups.yahoo.com/group/jsunit/
Welcome to AgileStuff.com, the place for Agile developers to find stuff that spreads the Agile word.

Our merchandise lets agile developers proudly show off what they believe in - from Test-Driven Development to Refactoring to Pairing. If you don't see something you'd like, drop us a line and let us know! AgileStuff is based in San Francisco, California.

http://www.cafepress.com/agilestuff
JsUnit

- No Form Support
- No Asynchronous Support
- Server Support - Java
- IDE Support - Eclipse, IDEA
- CruiseControl Support
JsUnit

**Strengths**
- Established,
- xUnit model,
- Active community.

**Weaknesses**
- Sole Developer,
- Conservative License,
- Irregular release schedule,
- Several known limitations.
JsUnit

Bottom Line

- Use when team members are already experienced with jsUnit
  - (and licensing is not an issue)
- Consider YUI Test to test asynchronous code if starting fresh
  - (or willing to try something new).
- For acceptance tests, add Selenium to the mix
JsUnit

Resources

- AJAX and Unit Testing - it's time to mingle, Jim Plush (2006 Feb)
  - http://www.litfuel.net/plush/?postid=117
  - http://www.litfuel.net/plush/?postid=154
YUI Test

- Testing framework for browser-based JavaScript solutions.
- Add unit testing to JavaScript solutions.
- Derives characteristics from nUnit and Junit.
YUI Test – Key Features

- Create test cases through simple syntax.
- Failure detection for methods that throw errors.
- Group related cases using test suites.
- Asynchronous tests for testing events and Ajax communication.
- Cross-browser DOM Event simulation.
YUI Test – Key Features

- Support for “A-Grade” Browsers
- Release 2.5.2 (2008 May)
  - Since 2005
- License – BSD
- ~16 Team Members
  - Yahoo! employees and contributors
Yahoo! UI Library: YUI Test

YUI Test is a testing framework for browser-based JavaScript solutions. Using YUI Test, you can easily add unit testing to your JavaScript solutions. While not a direct port from any specific xUnit framework, YUI Test does derive some characteristics from unittest and JUnit.

YUI Test features:

* Rapid creation of test cases through simple syntax.
* Advanced failure detection for methods that throw errors.
* Grouping of related test cases using test suites.
* Asynchronous tests for testing events and Ajax communication.
* DOM Event simulation in all A-grade browsers.

On This Page:

* Getting Started
  * Using Test Cases
  * Assertions
  * Simulating User Actions
  * Asynchronous Tests
  * Test Suites
  * Running Tests
  * Viewing Results
  * Test Reporting
  * YUI on Mobile Devices
  * Support & Community
  * Filing Bugs and Feature Requests

Quick Links:

* Examples: Explore examples of the Testing Framework in action.
* API Documentation: View the full API documentation for the Testing Framework.
* License: The YUI Library is issued under a BSD license.

Getting Started

To use YUI Test, include the following source files in your web page:

http://developer.yahoo.com/yui/yuitest/
Assertions

Test methods use assertions to check the validity of a particular action or function. An assertion method tests (asserts) that a condition is valid; if not, it throws an error that causes the test to fail. If all assertions pass within a test method, it is said that the test has passed. To aid in writing tests, the YAHOO.util.Assert object contains several assertion methods that can be used to validate data.

Topics covered in this section include:

- Equality Assertions
- Sameness Assertions
- Data Type Assertions
- Special Value Assertions
- Forced Failures

Equality Assertions

The simplest assertions are `isEqual()` and `isNotEqual()`. Both methods accept three arguments: the expected value, the actual value, and an optional failure message (a default one is generated if this argument is omitted). For example:

```javascript
<script type="text/javascript">
    var oTestcase = new YAHOO.util.TestCase();
    
    oTestcase equalityAssertions : function () {
        var Assert = YAHOO.util.Assert;

        Assert isEqual(5, 5); // passes
        Assert isEqual(5, "5"); // passes
        Assert isNotEqual(5, 6); // passes
        Assert isEqual(5, 6, "five was expected."); // fails
    }
</script>
```

These methods use the double equals (==) operator to determine if two values are equal, so type coercion may occur. This means that the string "5" and the number 5 are considered equal because the double equals sign converts the number to a string before doing the comparison. If you don't want
YUI Test Utility: Advanced Test Options

This example shows how to use advanced test options, which allow you to specify additional information about how a test should be run. Each `TestCase` can specify up to three different options for tests, including tests that should be ignored, tests that should throw an error, and tests that should fail.

http://developer.yahoo.com/yui/docs/module_yuitest.html
Yahoo! UI Library > yuittest > YAHOO.util.DateAssert

static Class YAHOO.util.DateAssert

The DateAssert object provides functions to test JavaScript Date objects for a variety of cases.

Methods

datesAreEqual
static void datesAreEqual (expected, actual, message)

Asserts that a date's month, day, and year are equal to another date's.

Parameters:
- expected <Date> The expected date.
- actual <Date> The actual date to test.
- message <String> (Optional) The message to display if the assertion fails.

Returns: void

timesAreEqual
static void timesAreEqual (expected, actual, message)

Asserts that a date's hour, minutes, and seconds are equal to another date's.

Parameters:
- expected <Date> The expected date.
- actual <Date> The actual date to test.
- message <String> (Optional) The message to display if the assertion fails.

Returns: void

http://developer.yahoo.com/yui/docs/YAHOO.util.DateAssert.html#method_datesAreEqual
Simple Use Case: TestCase Object

Create a Test case object with desired tests, add the Test case to the Test Runner object, and run the test:

```javascript
// set up a test case:
var oTestcase = new YAHOO.util.TestCase({
  name: "Simple Math",
  testEquality: function () {
    YAHOO.util.Assert.areEqual(4, (2+2), "2+2=4");
  }
});

// add the test case to the Test Runner:
YAHOO.tool.TestRunner.add(oTestcase);
YAHOO.tool.TestRunner.run(); // run the test
```

Key Events in YUITest

See online docs for full list of custom events, including TestSuite- and TestRunner-level events.

<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST_PASS_EVENT</td>
<td>When an individual test passes.</td>
</tr>
<tr>
<td>TEST_FAIL_EVENT</td>
<td>When an individual test fails.</td>
</tr>
</tbody>
</table>

Test-case level events:

<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST_CASE_BEGIN_EVENT</td>
<td>Before the Test Case is run.</td>
</tr>
<tr>
<td>TEST_CASE_COMPLETE_EVENT</td>
<td>After the Test Case is run.</td>
</tr>
</tbody>
</table>

YAHOO.util.TestRunner Methods:

- add(testCase or testSuite) adds a test case or test suite object to a test suite
- clear() removes all test objects from the runner
- run() runs all test case and test suites currently queued in the Test Runner

YAHOO.util.TestCase Methods:

- beforeEach() executes before each test
- afterEach() executes after each test
- test() executes a test
- testOnly() executes just one test

YAHOO.util.UserAction Methods:

- click() triggers an action on the target
- mouseUp() triggers a mouse up on the target
- mouseDown() triggers a mouse down on the target
- mouseOver() triggers a mouse over on the target
- mouseOut() triggers a mouse out on the target
- keyDown() triggers a key down on the target
- keyUp() triggers a key up on the target
- keyPress() triggers a key press on the target

Dependencies

The YUI Test Utility requires the Yahoo Global Object, Dom Collection, Event Utility, and Logger Control. The Logger's CSS file and the YUI Test CSS file are also required.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Author</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Re: Some problems of dialog, tabview and datatable in a page</td>
<td>magic_seek</td>
<td>Aug 10, 2008 11:18 pm</td>
</tr>
<tr>
<td>RE: [ydn-javascript] Need help on YUITest</td>
<td>Nicholas C. Zakas</td>
<td>Jul 25, 2008 2:42 pm</td>
</tr>
<tr>
<td>Re: [ydn-javascript] YUI Callback Object and Scope</td>
<td>Satyam satyamutsa</td>
<td>Jun 27, 2008 4:11 am</td>
</tr>
<tr>
<td>YUI Callback Object and Scope</td>
<td>tehjustin</td>
<td>Jun 26, 2008 6:14 pm</td>
</tr>
<tr>
<td>RE: [ydn-javascript] Editor CSS and IE7</td>
<td>Richard Benson poolump</td>
<td>Jun 26, 2008 7:13 am</td>
</tr>
</tbody>
</table>

http://tech.groups.yahoo.com/group/ydn-javascript/msearch?query=yuitest
YUI Test

- Form Support
- Asynchronous Support
- No Server Support
- No IDE Support
- No CI Support
YUI Test

Strengths

- Bundled with YUI Library
- Large, well-funded team
- Regular releases
- Active community
- Well documented

Weaknesses

- Bundled with YUI Library
YUI Test

Bottom Line:
- Use when coding JavaScript or Ajax applications
- Good for simple event/form tests
- For true acceptance tests, add Selenium to the mix
YUI Test

Resources

- Writing Your First YUI Application, Eric Miraglia (2008 May)
  - http://www.insideria.com/2008/05/writing-your-first-yui-applica.html
Open QA Selenium

Selenium is a suite of tools to automate web app testing across many platforms

**Selenium IDE** records and runs tests as a Firefox Plugin.

**Selenium Remote Control** runs tests across multiple platforms

**Selenium Grid** distributes test running across multiple machines
Selenium – Key Features

- Create test scripts using Selenium Commands.
- Run tests in against live applications.
- Compile test scripts in native languages, such as Java, C#, Ruby.
- Integrate scripts with other test suites and continuous integrations systems.
Selenium – Key Features

- Support for Firefox 2+, (RC and Core) IE7, Safari 2+, Opera 8+, Windows, OS X, Linus, Solaris.
- Release 1.0-beta (2008 March)
  - Since 2005
- License – Apache
- ~11 Team Members
  - Originated as ThoughWorks project
Get started with Selenium

0. Watch: see the magic.

1. Begin: write and run tests in Firefox.
   Selenium IDE is a Firefox addon that records clicks, typing, and other actions to make a test, which you can play back in the browser.
   Download Selenium IDE Learn more Screenshots

2. Customize: your language, your browser.
   Selenium Remote Control (RC) runs your tests in multiple browsers and platforms. Tweak your tests in your preferred language.
   Download Selenium RC Learn more Screenshots

3. Deploy: scale out, speed up.
   Selenium Grid extends Selenium RC to distribute your tests across multiple servers, saving you time by running tests in parallel.
   Download Selenium Grid Learn more Screenshots

Learn Selenium

- The Magic of Selenium: How it works
- Support Matrix: Operating Systems, Browsers, Programming Languages
- Screencasts
- Tutorials / Labs
- Selenium API

Selenium News

- Selenium Meetup @ the Googleplex - February 2008

Selenium is a suite of tools to automate web app testing across many platforms.

Selenium...

- runs in many browsers and operating systems
- can be controlled by many programming languages and testing frameworks.

Looking to Automate Test?

Try new QA Wizard
Pro, Free Trial, Test Window and Web
How Selenium Works

See also: Selenium IDE, Selenium Remote Control and Selenium Grid.

Selenium IDE

Firefox Plugin

Records and plays back tests in Firefox; a great way to get started writing tests.

Selenium IDE allows you export your tests to many programming languages, (including Ruby, PHP, Java, perl, C#, and Python) so you can tweak your tests and even put them into your existing testing framework.

Your tests

Your tests are made of a series of Selenium commands, which are sent to the Selenium Remote Control server or the Selenium Grid server.

Selenium Remote Control

Java-based command line server

Selenium Remote Control starts up browsers (one at a time) and then runs commands you pass along from your tests.

Selenium Grid

Java-based command line server

Selenium Grid coordinates multiple Selenium Remote Control servers so you can run tests on lots of platforms at the same time, which saves lots of time and allows wider testing.

Selenium is a suite of tools to automate web app testing across many platforms.

Selenium ...

- runs in many browsers and operating systems
- can be controlled by many programming languages and testing frameworks

Looking to Automate Test?

Try new QA Wizard Pro, Free Trial, Test Window and Web Applications.

http://selenium.openqa.org/documentation/
MailReader Options
- Register with MailReader
- Log into MailReader

Language Options
- English
- Japanese
- Russian
MailReader Options

- Register with MailReader
- Log into MailReader

Language Options

- English
- Japanese
- Russian

http://localhost:8080/menu/Register.action
Username: trillian
Password: *****
(Repeat) Password: *****
Full Name: Tricia McMillian
From Address: from@address.com
Reply To Address: 

Table Source

<table>
<thead>
<tr>
<th>Command</th>
<th>Target</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>assertTitle</td>
<td>MailReader - Register</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Register_save_password... trillian</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Register_save_password... astra</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Register_save_password... ZXGFZ</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Register_save_password... astra</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Register_save_fullName Tricia McMillian</td>
<td></td>
</tr>
<tr>
<td>type</td>
<td>Register_save_fromAddress <a href="mailto:from@address.com">from@address.com</a></td>
<td></td>
</tr>
</tbody>
</table>

Log Reference

`type(locator, value)`

Arguments:
- locator - an element locator
- value - the value to type

Done
Username: trillian
Password: *****
(Repeat) Password: *****
Full Name: Tricia McMillian
From Address: from@address.com
Reply To Address: [blank]
Main Menu Options for Tricia McMillian

- Edit your registration profile
- Log out of MailReader application
MailReader Options

- Register with MailReader
- Log into MailReader

Language Options

- English
- Japanese
- Russian
MailReader Options

- Register with MailReader
- Log into MailReader

Language Options

- English
- Japanese
- Russian
### Main Menu Options for Tricia McMillian

- [Edit your registration profile](#)
- [Log out of MailReader application](#)

### Table

<table>
<thead>
<tr>
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<tr>
<td><code>assertTitle</code></td>
<td>MailReader - Register</td>
<td></td>
</tr>
<tr>
<td><code>type</code></td>
<td>Register_save_username</td>
<td>trillian</td>
</tr>
<tr>
<td><code>type</code></td>
<td>Register_save_password</td>
<td>astra</td>
</tr>
<tr>
<td><code>type</code></td>
<td>Register_save_password</td>
<td>astra</td>
</tr>
<tr>
<td><code>type</code></td>
<td>Register_save_fullName</td>
<td>Tricia McMillian</td>
</tr>
<tr>
<td><code>type</code></td>
<td>Register_save_fromAddress</td>
<td><a href="mailto:from@address.com">from@address.com</a></td>
</tr>
<tr>
<td><code>clickAndWait</code></td>
<td>Register_save_Save</td>
<td></td>
</tr>
<tr>
<td><code>assertTitle</code></td>
<td>MailReader - Menu</td>
<td></td>
</tr>
</tbody>
</table>

### Command

- `open`

- `Target`: `/menu/Welcome.action`

- `Value`: `Find`
<tr><td>open</td><td>Welcome.action</td></tr>
<tr><td>assertTitle</td><td>MailReader</td></tr>
<tr><td>clickAndWait</td><td>link=Register with MailReader</td></tr>
<tr><td>assertTitle</td><td>MailReader - Register</td></tr>
<tr><td>type</td><td>Register_save_username</td><td>trillian</td></tr>
<tr><td>type</td><td>Register_save_password</td><td>astra</td></tr>
<tr><td>type</td><td>Register_save_password2</td><td>astra</td></tr>
<tr><td>type</td><td>Register_save_fullName</td><td>Tricia McMillian</td></tr>
<tr><td>type</td><td>Register_save_fromAddress</td><td>tricia@magrathea.</td></tr>
<tr><td>clickAndWait</td><td>Register_save_Save</td></tr>
<tr><td>assertTitle</td><td>MailReader - Menu</td></tr>
<tr><td>assertTextPresent</td><td>Tricia McMillian</td></tr>
Main Menu Options for Tricia McMillian

- Edit your registration profile
- Log out of MailReader application
Main Menu Options for MailReader

- Edit your registration
- Log out of MailReader
public class RegisterTrillianTest extends SeleneseTestCase {
    public void testRegisterTrillian() throws Exception {
        selenium.open("/menu/Welcome.action");
        assertEquals("MailReader", selenium.getTitle());
        selenium.click("link=Register with MailReader");
        selenium.waitForPageToLoad("30000");
        assertEquals("MailReader - Register", selenium.getTitle());
        selenium.type("Register_save_username", "trillian");
        selenium.type("Register_save_password", "astra");
        selenium.type("Register_save_password2", "astra");
        selenium.type("Register_save_fullName", "Tricia McMillian");
        selenium.type("Register_save_fromAddress", "from@address.com");
        selenium.click("Register_save_Save");
        selenium.waitForPageToLoad("30000");
        assertEquals("MailReader - Menu", selenium.getTitle());
        checkForVerificationErrors();
    }
}
OpenQA Selenium

- Form Support
- Asynchronous Support
- Server Support
- IDE Support
- CI Support
OpenQA Selenium

**Strengths**
- Granual toolset
- Large, dedicated team
- Steady releases
- Active community

**Weaknesses**
- Complex setup
- Superficial suite support
- Choppy documentation
- Slow releases
OpenQA Selenium

Bottom Line

- Use to create acceptance tests
- Complements unit tests
CruiseControl

- Continuous build process framework
- Plugins for email notification, Ant, and source control tools.
- Web interface to view build details
CruiseControl – Key Features

- Build loop – On trigger event, runs tasks, notifies listeners
- Legacy reporting - Browse results of build loop and access artifacts
- Dashboard - Visual representation of project status
CruiseControl – Key Features

- Java, Ruby, and .NET projects
- Several third-party tools and plugins
- Java Release 2.7.3 (2008 July)
  - Since 2001
- License – BSD Style
- ~8 Team Members
CruiseControl

CruiseControl is a framework for a continuous build process. It includes, but is not limited to, plugins for email notification, Ant, and various source control tools. A web interface is provided to view the details of the current and previous builds.

CruiseControl is distributed under a BSD-style license and is free for use. CruiseControl adheres to an open source model and therefore makes the source code freely available.

CruiseControl is maintained and developed by a group of dedicated volunteers.

What is Continuous Integration?

Continuous Integration by Martin Fowler and Matthew Foemmel.

An important part of any software development process is getting reliable builds of the software. Despite its importance, we are often surprised when this isn't done. We stress a fully automated and reproducible build, including testing, that runs many times a day. This allows each developer to integrate daily thus reducing integration problems.

http://cruisecontrol.sourceforge.net/
Project: cceqa-config-manager
Server: 10.18.2.3
Status: Queued
Last build result: Passed
Last build date: 7 days ago
Open Build

http://cruisecontrol.sourceforge.net/dashboard.html
Welcome to CruiseControlDocs, the community maintained documentation wiki for CruiseControl.

Documentation is also distributed as part of CruiseControl, and can be found online at http://cruisecontrol.sourceforge.net/.

GeneralInformation

How to use it: GettingStarted

MoreDetails

- the Build Loop
- the Reporting Web application
- Misc

Support

- SupportTips
- Frequently Asked Questions

3rdPartyCCStuff

- Build monitors
- Reporting applications
- Configuration utilities
- Other

AboutThisSite

Read and add onto great CruiseControl documentation! If you’re editing, please follow along with GoodStyle. Thanks, The Management


IntegratingWithOtherTools

- Build Tools
- SCM Tools
- Code Analysis, Testing, and Metrics Tools
- Development Tools, Environments, and Languages
- Operating Systems
- Other

DistributingBuildsWithCruiseControl

RealWorldStories

Off-Line Documentation

- A copy of the website at http://cruisecontrol.sourceforge.net/ is packaged with the released zip file.
- An extract of this wiki can be downloaded by using the Export Space feature.

ExternalLinks

http://confluence.public.thoughtworks.org/display/CC/Home
<table>
<thead>
<tr>
<th>Topic</th>
<th>Topic Starter</th>
<th>Thread Posts</th>
<th>Last Post</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="http://sourceforge.net/mailarchive/forum.php?forum_name=cruisecontrol-user" alt="Image" /></td>
<td>[Cruisecontrol-user] Dependency build scenario</td>
<td>Cheng Wei Lee &lt;techmailinglists@gm...&gt;</td>
<td>0</td>
</tr>
<tr>
<td><img src="http://sourceforge.net/mailarchive/forum.php?forum_name=cruisecontrol-user" alt="Image" /></td>
<td>Re: [Cruisecontrol-user] Change Server Name in Dashboard Header</td>
<td>Easwaran &lt;easwaran.nampoothiri@nb...&gt;</td>
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Let's Code It!
Ajax Testing Tool Review

During the session, we covered

- when, what, and how to test Ajax applications
- creating automatic tests with various tools
- testing with IDEs and continuous Integration systems
Square One University Series