

Test automation for a web application

on the basis of differences
and most basic and common errors
found with Open Source software –
AET in theory and practice

Radek Lawgmin
Maciej Laskowski

About us

Radek Lawgmin

Radek Lawgmin is a lead senior QA engineer and a product owner in the AET project at Cognifide.

He is interested in process optimization, software test efficiency vs. effectiveness and new technologies.

He has been working in AEM projects at Cognifide for over four years. Before engaged in various e-learning projects.



About us

Maciej Laskowski

Maciej Laskowski is a senior software engineer at Cognifide. His interest and experience is focused mainly in the area of system integration, scalability and backend web development.

He has been at Cognifide for over three years. He works as an architect and a technical leader in the Automated Exploratory Tests (AET) project. During shaping AET Maciej has used his AEM expertise to boost scalability.



About us

Cognifide - who we are

We are the experts in delivering technologically advanced web applications, built on the basis of a CMS (Adobe AEM, Sitecore).



About us

Cognifide - our clients

Our technology powers over 400 websites worldwide and our expertise helps clients to save money whilst improving the author and customer experience every step of the way.



Workshop

What we will learn today?



Agenda

Section 1.0 – QA process at Cognifide

Section 2.0 – Introduction to AET

Section 3.0 – AET environment setup

Section 4.0 – Launching tests – exercises

Section 5.0 – Advanced settings – exercises

Section 6.0 – Result analysis, test stabilization

Section 7.0 – AET Roadmap

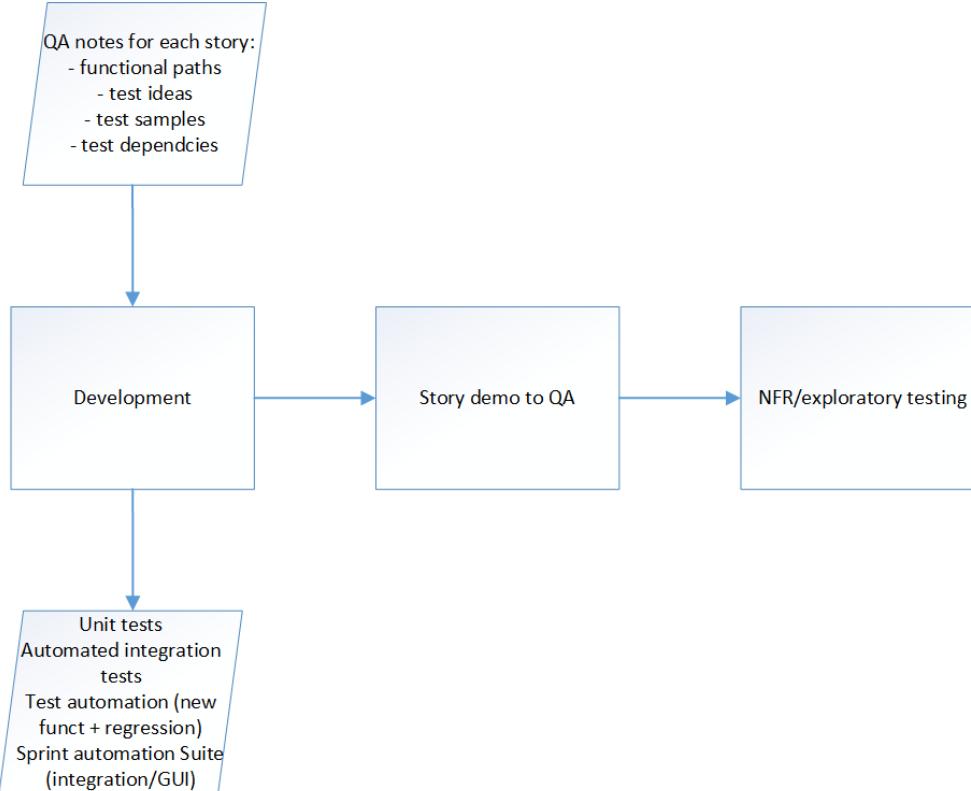
Section 8.0 – Workshop Summary

Section 1.0

QA process at Cognifide

QA process at Cognifide

How we care about quality – automation strategy



Section 2.0

Introduction to AET

Background

Cognifide case

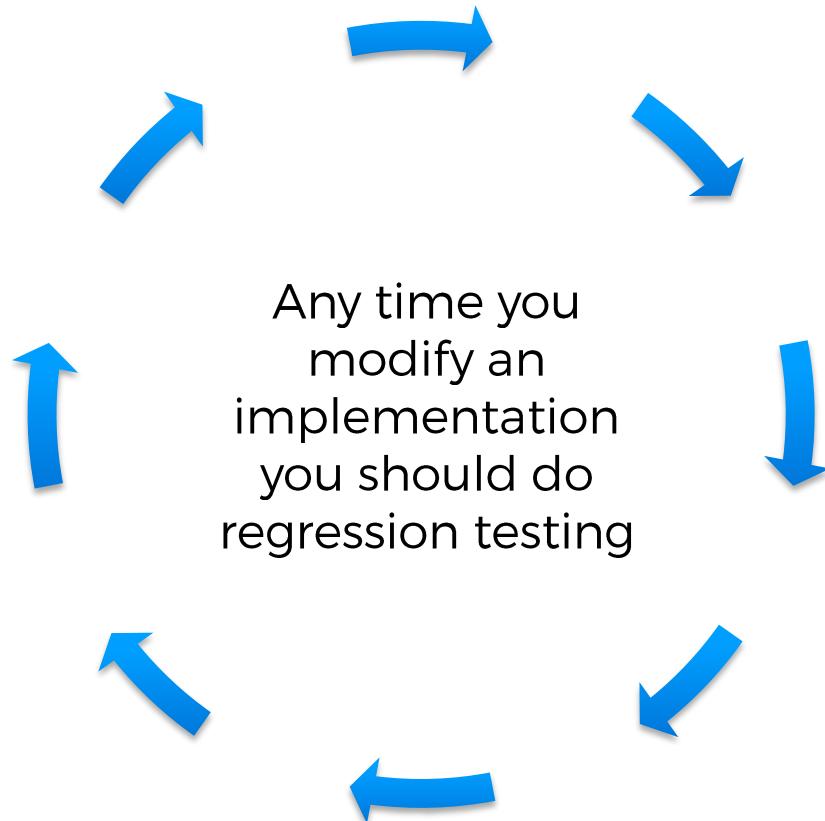
- a few hundred thousand pages to migrate
- missing requirements
- lack of time
- checking functional aspects of a given page is not enough – it does matter how this page looks like!



Background

Regression testing

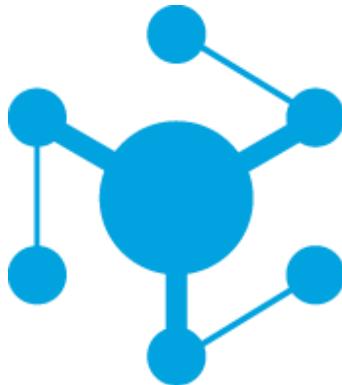
- time consuming
- expensive
- human error aspect



Background

Problems with regression?

Solution:

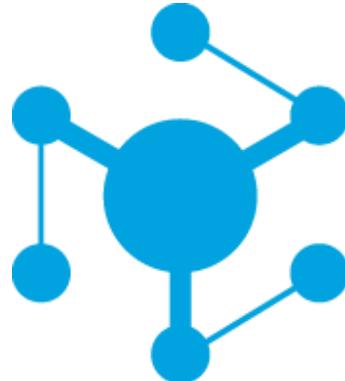


aet

What is AET?

Automated Exploratory Testing

- a testing tool developed at Cognifide
- it helps testers to ensure that a **change** in one part of the software has not introduced new defects in other parts of the software
- it helps to assess the **impact or change** of website
- it aids front-end client side layout **regression testing**

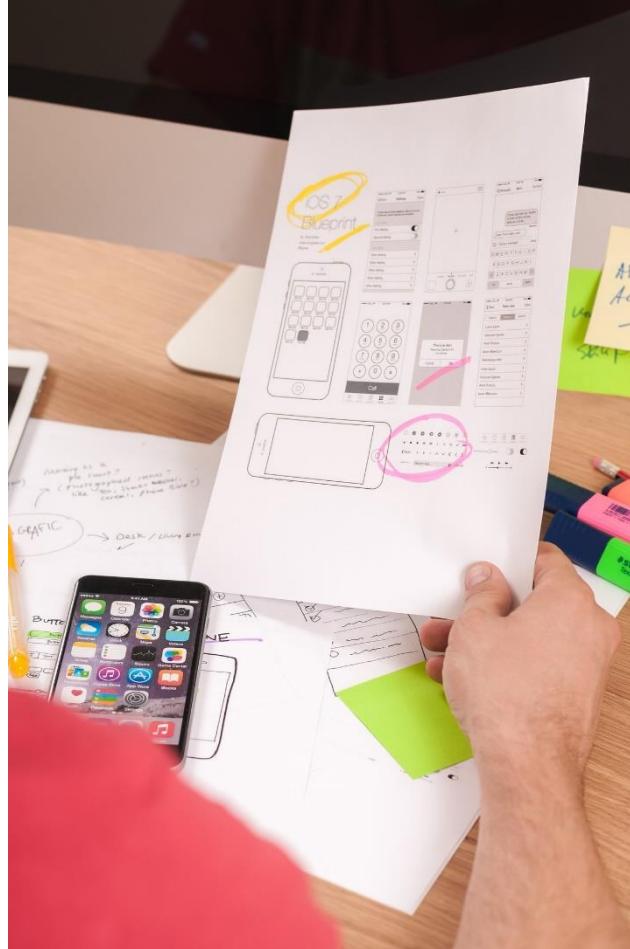


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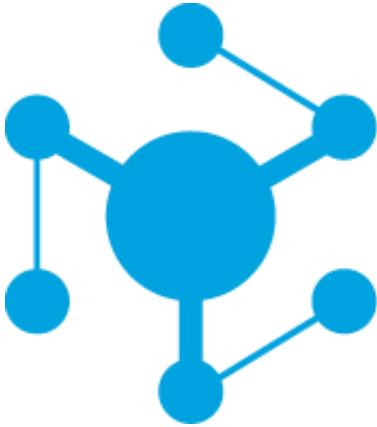
Test Processing

A typical scenario of use

1. the AET user (Developer or QA) **baselines** a set of components or pages with URLs as an input to the tool.
2. the CMS user **changes** the page component or content.
3. the '*current baseline*' is used to **compare** with the '*new version*' and the change is assessed for one of the 3 possibilities:
 - there are no changes - no involvement required
 - there is a change but the user accepts it, which means she/he re-baselining
 - there is a change and the user does not accept it, so she/he has to fix it
4. AET produces a report



Short demo

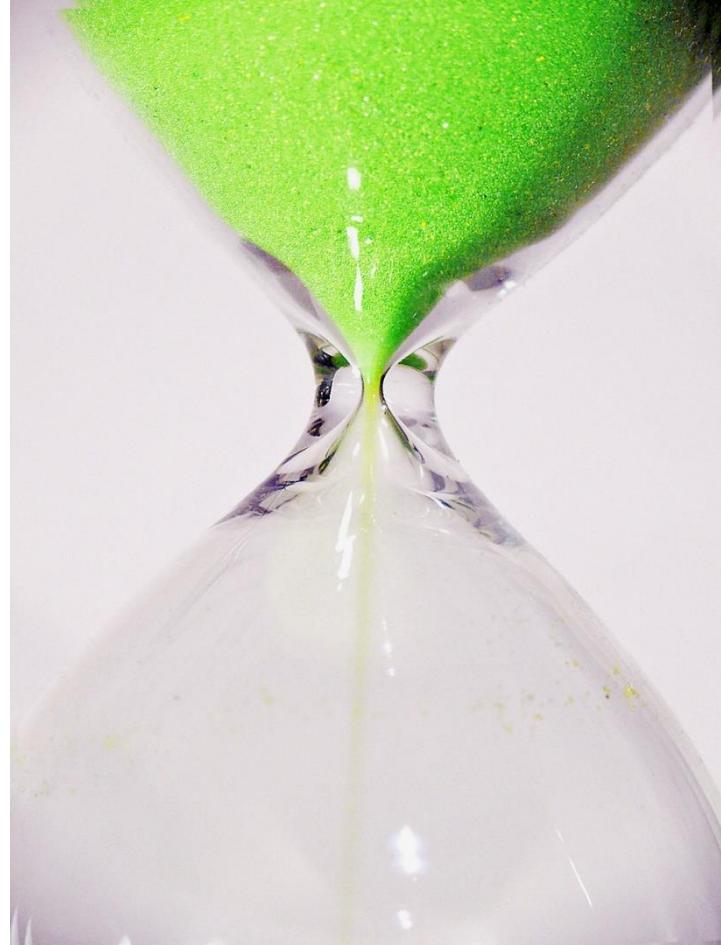


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What does AET test?

The following features are currently enabled:

- layout comparison (mask/big screen on/off)
- responsiveness (screen width)
- W3C compliance
- JS errors
- status codes
- source code comparison
- accessibility
- Integration with CI tools!



When you can make use of AET?

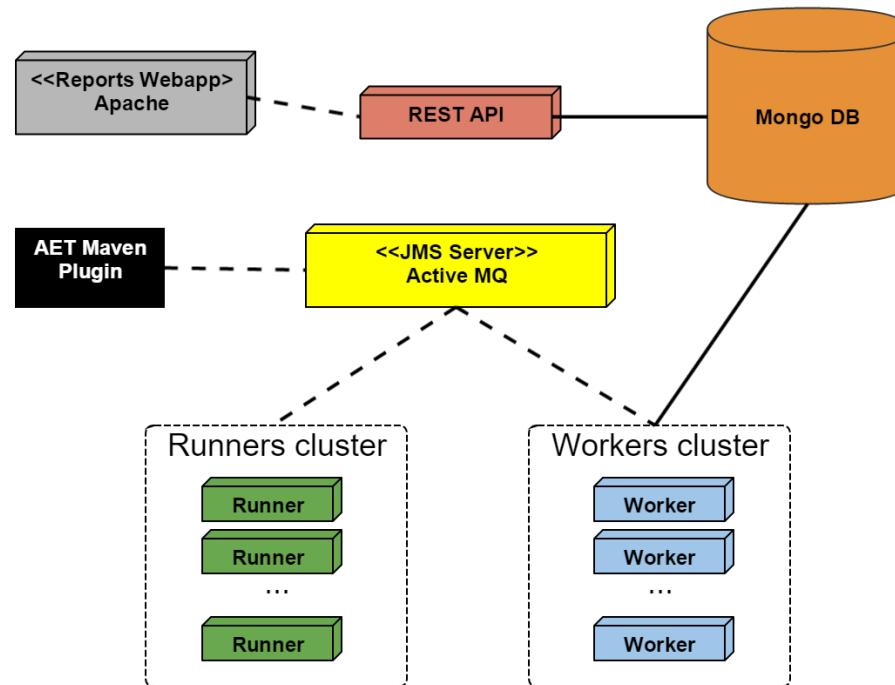
AET can be most useful for:

- testing large websites or large portfolios using common components in a CMS
- unit testing custom components for a CMS project
- regression tests at the end of an Hourly/Daily/Weekly/Per Sprint Completion
- as part of an upgrade or migration of infrastructure / platform migration



AET architecture

System components



AET architecture

Suite - test - url - case

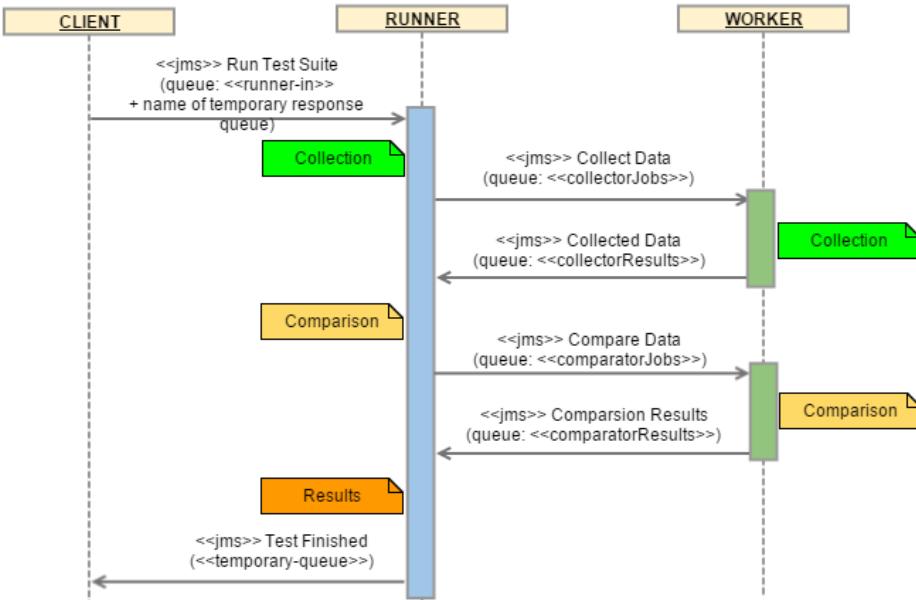
```
<suite name="sample" company="testwarez" project="workshops">
  <test name="my-first-test">
    <collect>
      <open/>
      <sleep duration="1000"/>
      <screen/>
    </collect>
    <compare>
      <screen/>
    </compare>
    <urls>
      <url href="http://cognifide.com"/>
    </urls>
  </test>
</suite>
```

AET architecture

Suite - test - url - case

```
<suite name="sample" company="testwarez" project="workshops">
  <test name="my-first-test">
    <collect>
      <open/>
      <sleep duration="1000"/>
      <screen/>
    </collect>
    <compare>
      <screen/>
    </compare>
    <urls>
      <url href="http://cognifide.com"/>
    </urls>
  </test>
</suite>
```

Test Life Cycle



AET Reports

Test Overview

Search...

No filters applied

TESTS: 1 (1/0/0/0)

homepage 1

url:/index.html

LAYOUT FOR DESKTOP ACCESSIBILITY JS-ERRORS SOURCE SOURCE W3C-HTML5 STATUS-CODES

Settings Show Mask

Pattern View

Demo page TestWarez 2016 Home About Contact

Hello, world!

Learn more »



Heading A

(b) display, mequod sed la tipi crmaro / estit tellus, mepli dlem, sed electio i- d'quem id prigens, de, ac Deneb conseque posseut crasit emen blandit, Quis qui qis rist flogis ligu/ utsumnefficitur ou neq; nequeum non lorum.

View details »

Heading B

Phasellus ut efficitur sem. In maximus neque nec metus vestibulum pellentesque. Integer id nunc felis. Sed in bibendum ex. Praesent massa nunc, fermentum vitae triduct nec, euismod ut nulla, egot dui sit amet metus fermentum voluptat ac eu odo.

View details »

Heading C

Quisque pune lectus, suscipit nee efficitur sit, egotis ut, visti. Meius efficitur feugiat, turpis, ac accumsen nibus attempus ac. Quis a dolor amon, Sed penus erit, cennolis i-sagittis quis efficitur ou condimentum non lorum.

View details »

Total cases: 6 (6/0/0/0) (0/2) Project: workshops Suite: exerciseI v8 Last change: 2016-09-22 16:49:35

Pattern collected: Sep 22, 2016 4:49:08 PM

Demo page TestWarez 2016 Home About Contact

Hello, world!

Learn more »



Heading A

(b) display, mequod sed la tipi crmaro / estit tellus, mepli dlem, sed electio i- d'quem id prigens, de, ac Deneb conseque posseut crasit emen blandit, Quis qui qis rist flogis ligu/ utsumnefficitur ou neq; nequeum non lorum.

View details »

Heading B

Phasellus ut efficitur sem. In maximus neque nec metus vestibulum pellentesque. Integer id nunc felis. Sed in bibendum ex. Praesent massa nunc, fermentum vitae triduct nec, euismod ut nulla, egot dui sit amet metus fermentum voluptat ac eu odo.

View details »

Heading C

Quisque pune lectus, suscipit nee efficitur sit, egotis ut, visti. Meius efficitur feugiat, turpis, ac accumsen nibus attempus ac. Quis a dolor amon, Sed penus erit, cennolis i-sagittis quis efficitur ou condimentum non lorum.

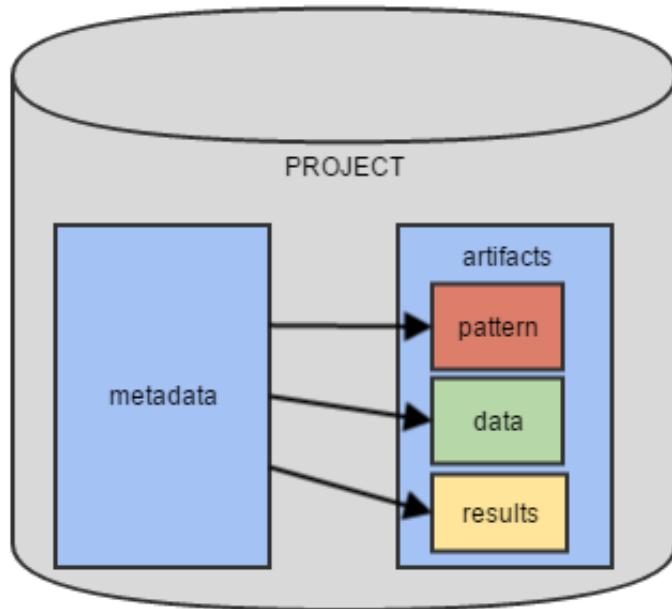
View details »

© AET 2016/01/06 user-agent: Mozilla/5.0 (X11; Linux x86_64; rv:38.0) Gecko/20100101 Firefox/38.0

© AET 2016/01/06 user-agent: Mozilla/5.0 (X11; Linux x86_64; rv:38.0) Gecko/20100101 Firefox/38.0

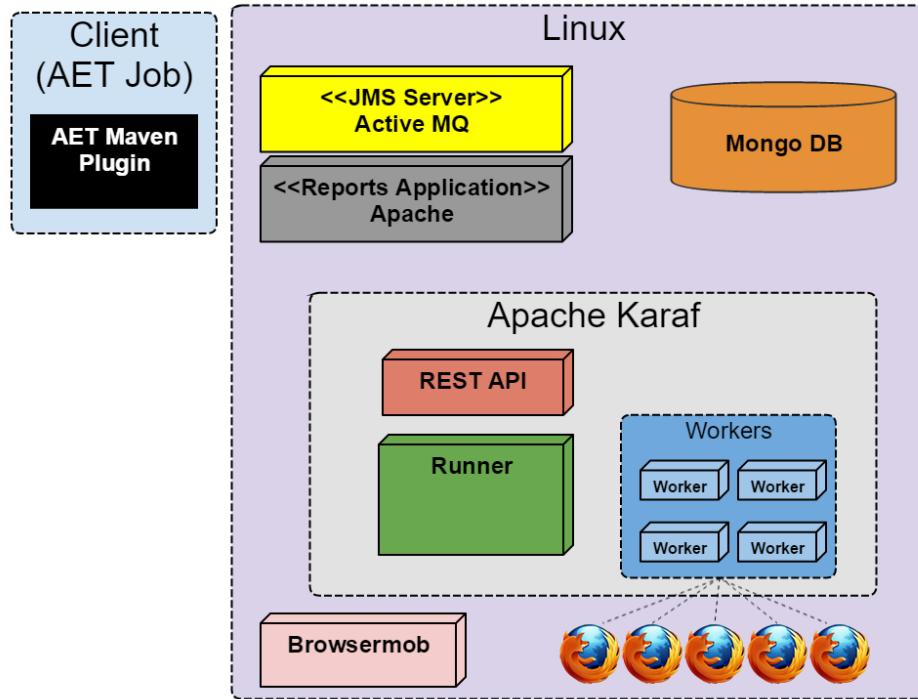
Data Structure

Data storage



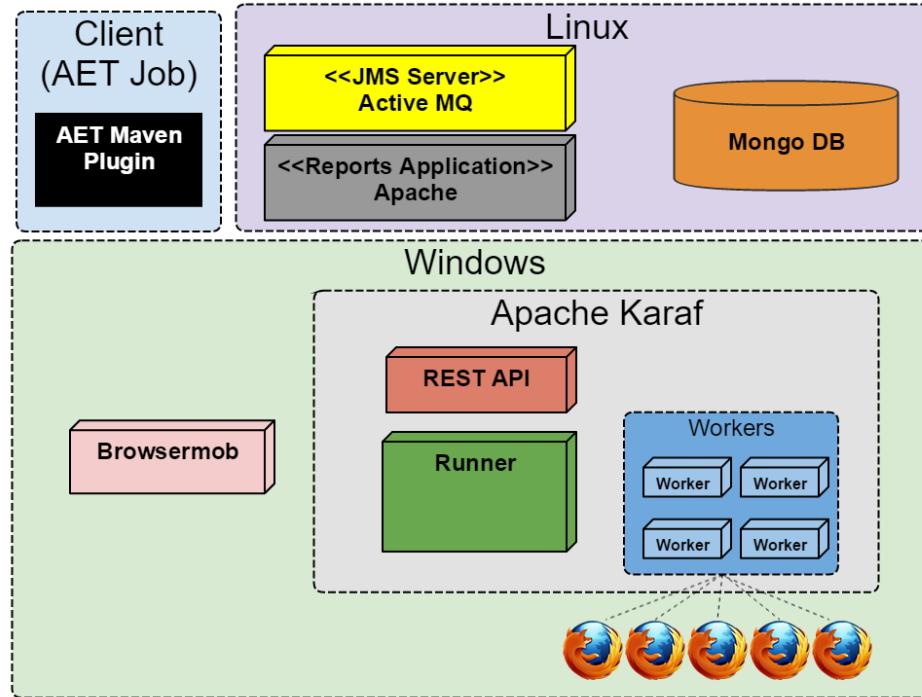
Deployment variants

Basic setup



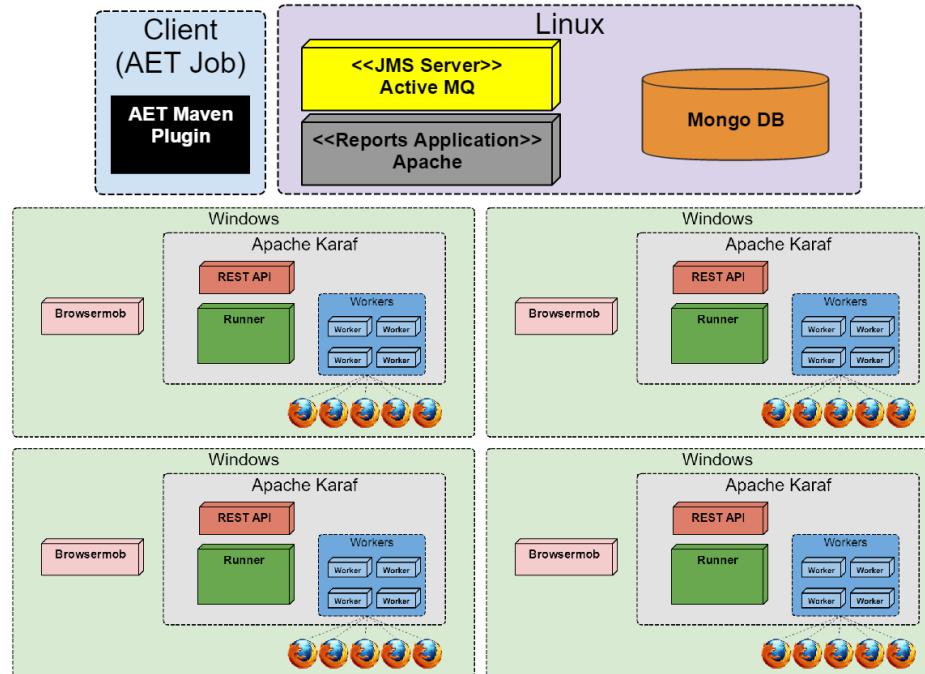
Deployment variants

Advanced (production-ready) setup



Deployment variants

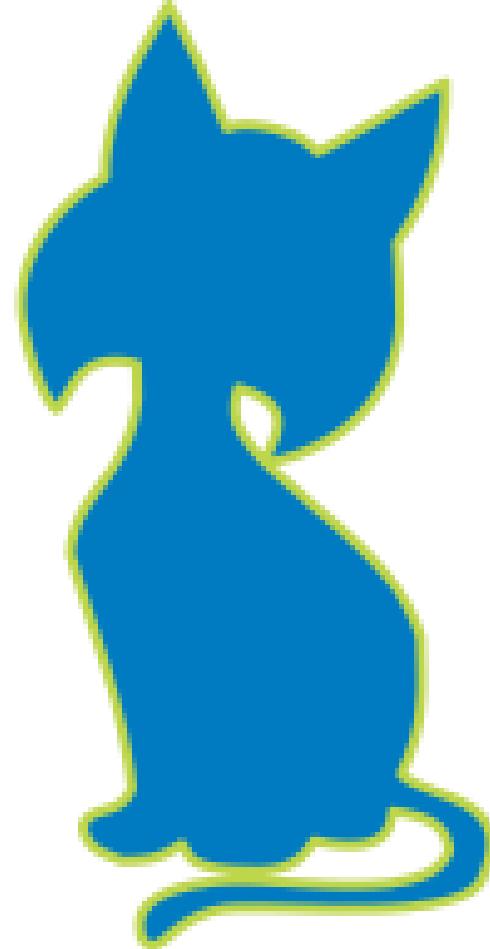
Scalability



What AET does not test

The following areas are beyond the scope for AET

- functional testing (including user journeys) = BOBCAT
- cross-browser testing
- how a given page behaves in a given browser
- usability testing
- security
- server-side performance

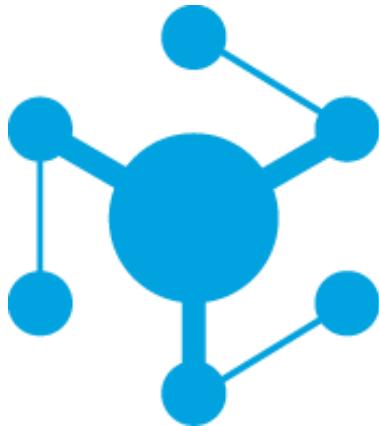


Section 3.0

AET environment setup

Online guide and exercises

<https://github.com/Cognifide/TestWarez2016>



aet

AET installation on local machines

Make sure your machine meets the following required preconditions

- OS: MS Windows or Linux (Ubuntu/Centos/Fedora/Redhat) or Mac OS X
- VirtualBox 5.0.26
- Vagrant 1.8.4
- ChefDK 0.17.17
- Git client
- Java SE 7
- Maven 3.3.9
- Vim/Notepad++ or other test editor allowing to edit XML files
- Google Chrome



AET installation on local machines

Clone or download AET repositories from GitHub

repositories are available at:

- <https://github.com/Cognifide/AET>



AET installation on local machines

Vagrant configuration

as the Administrator execute the following commands:

```
vagrant plugin install vagrant-omnibus
```

```
vagrant plugin install vagrant-berkshelf
```

```
vagrant plugin install vagrant-hostmanager
```



AET installation on local machines

First run

as the Administrator execute the following commands inside the application/vagrant directory:

berks install – to download Chef dependencies from external sources

vagrant up – to create a new virtual machine



VAGRANT

AET installation on local machines

Prepare your test suite xml file

- configure your first **suite** and name it according to your convenience
- remember about the **Open** module:
 - a special operand for collect phase
 - responsible for opening the web page for a given url and preparing browser environment to perform chain of collections and modifications
 - it allows the user to easily perform actions before page is opened

Each collect phase must contain open module

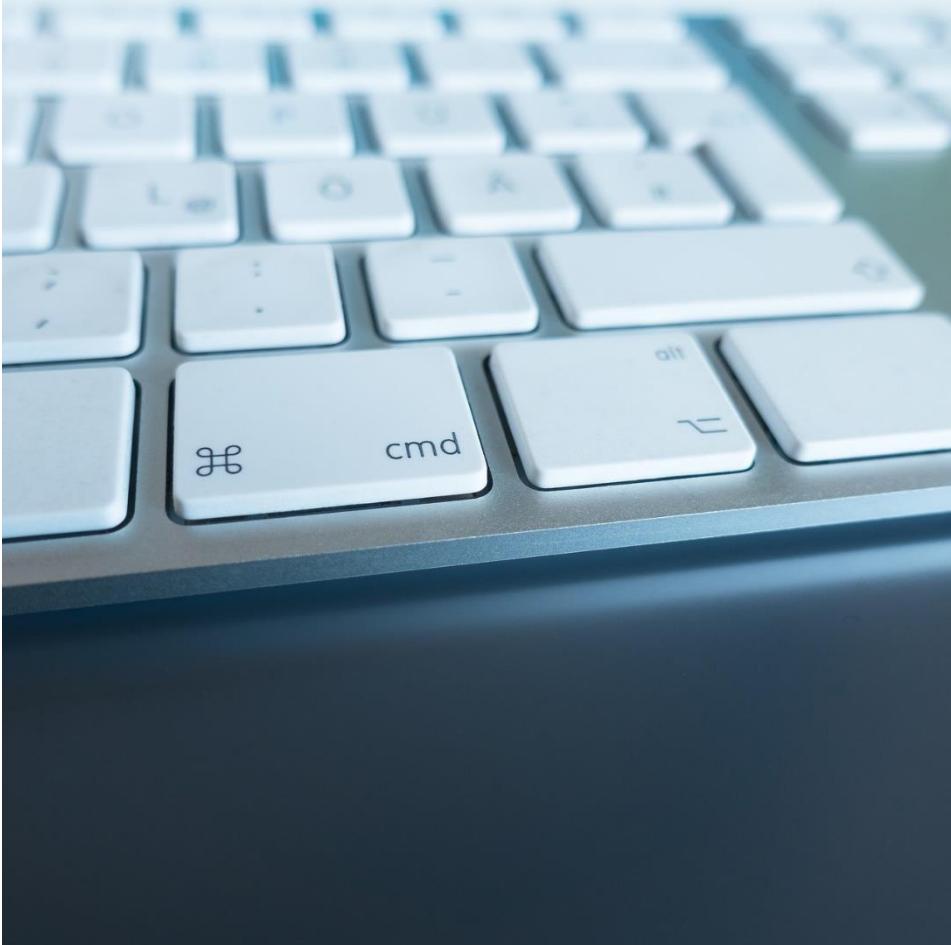
```
<suite name="warmup" company="testwarez" project="workshops">
  <test name="my-first-test">
    <collect>
      <open/>
      <sleep duration="1000"/>
      <screen/>
    </collect>
    <compare>
      <screen/>
    </compare>
    <urls>
      <url href="http://cognifide.com"/>
    </urls>
  </test>
</suite>
```

AET installation on local machines

Run your test

as the Administrator execute the following command:

```
mvn aet:run -DtestSuite=FULL_PATH_TO_TEST_SUITE
```



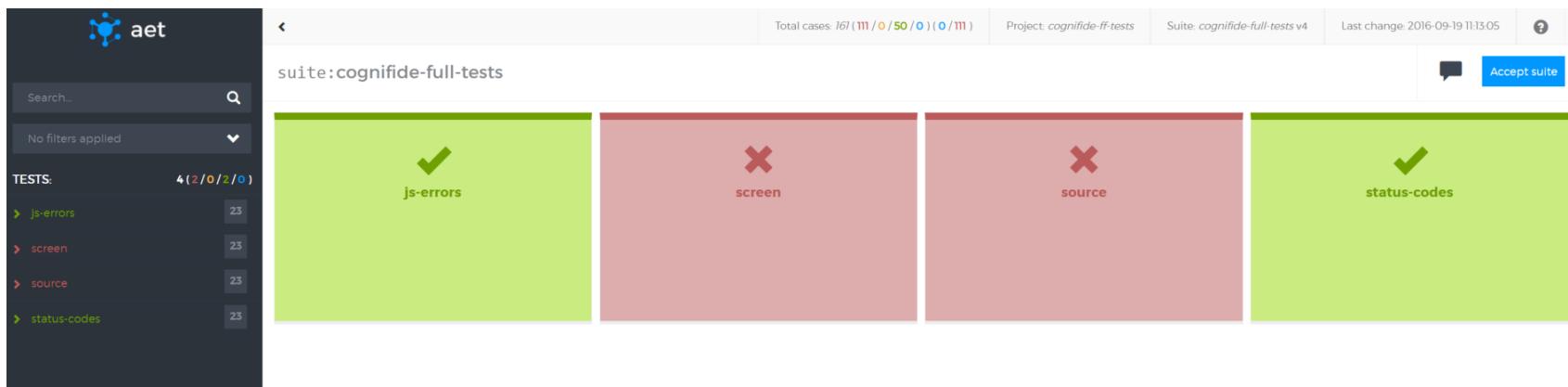
AET installation on local machines

Check your report

use your Chrome browser to visit:

<http://localhost:8181/configs/list>

where you can find the list of your reports generated by AET



Section 4.0

Launching tests - exercises

Screenshot comparison

Usage

- the operation on the screenshots
- screenshots are compared to the patterns that were accepted before

```
<collect>
  ...
  <screen name="desktop"/>
  ...
</collect>
<compare>
  ...
  <screen comparator="layout"/>
  ...
</compare>
```

Screenshot comparison

Report

LAYOUT FOR DESKTOP LAYOUT FOR MOBILE LAYOUT FOR TABLET LAYOUT FOR SMARTTV

Settings Show Mask

Pattern

View

Pattern collected: Jun 15, 2016 1:54:47 PM Accept test case

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Maven Vault Checkout Plugin (vtco) - using Maven for content checkout
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24 May 2016 | Tomasz Wagner Adobe CQ / AEM
Touch UI - dynamic dropdown by AEM Zen Garden
If you have been following our series of blogs on Touch UI, welcome to the third instalment, where you find us continuing our journey to convert all AEM Zen Garden's dialogs from Classic UI to Touch UI.

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- > Agile Practices
- > Customer Experience Management
- > Content Strategy
- > Adobe CQ / AEM
- > Customer Insights
- > EHS Server
- > External Blogs
- > General
- > Marketing Technology
- > Mobile
- > Performance
- > Quality Assurance
- > Best Practice
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- > Sharepoint
- > Sitecore
- > Technology
- > Uncategorized
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Bobcat meets AEMout Plugin (vtco) - using Maven for content checkout. This blog is written from other test automation frameworks, like Checkout Plugin to help you upgrade and modify simple content easily and often. Check out how you can use it here.

02 September 2016 | Sharad Naqvi, Vice President, Analytics, Barclays 5 pitfalls of personalisation and how to Zen avoid them
We've been talking to Sharad Naqvi, Vice President of Analytics at Barclays, about the trials and tribulations of perfecting the personalisation approach. He kindly agreed to share some of his thoughts with us here...

Categories

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- > Customer Insights
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- > External Blogs
- > General
- > Marketing Technology
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- > Security
- > Sharepoint
- > Sitecore
- > Technology
- > Uncategorized
- > User Experience
- > Zen Garden

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JS comparison

Usage

- the operation on the collected JavaScript errors
- errors are reported on the basis of the filter configuration that filters out the results returned by the JS Errors Collector (all the errors matched are removed from the report)
- the JS comparison feature does not allow to collect patterns

```
<collect>
  ...
  <js-errors/>
  ...
</collect>
<compare>
  ...
  <js-errors/>
  ...
</compare>
```

JS comparison

Report

JS-ERRORS



No.	Error	Source	Line number
1	ReferenceError: nonExistingVariable is not defined	http://jas-integration-aet.cognifide.com/sample-site/sanity/comparators/jserrors/failed.jsp	390

Source code comparison

Usage

- the operation on page code
- page code is compared to its pattern that was accepted before and each change is marked:
 - a new chunk is marked with green
 - a removed chunk is marked with red

```
<collect>
  ...
<source/>
  ...
</collect>
<compare>
  ...
<source/>
  ...
</compare>
```

Source code comparison

Report

url: /contact-us

< > Accept url

SOURCE SOURCE

Settings	Show Full Source	Accept test case
# Pattern		# Source
36 <meta name="VlcurrentDateTime" content="636015886886167288">		36 <meta name="VlcurrentDateTime" content="636022625107206288">
204 <div id="bbf64025_4300_4fc5_be1e_7a66f2b840e9" class="map-canvas" style="height: 100%; width: 100%"></div>		204 <div id="814bcf22-0436-425a-840d-518e69ad315c" class="map-canvas" style="height: 100%; width: 100%"></div>
235 <div id="fa43ce6e-58e8-4825-9e42-9458992e0e82" class="map-canvas" style="height: 100%; width: 100%"></div>		235 <div id="93a519af-8462-4dba-a7a8-16b25c04bddf" class="map-canvas" style="height: 100%; width: 100%"></div>
266 <div id="af45e855-c41f-4feb-9630-77f2f0eb569" class="map-canvas" style="height: 100%; width: 100%"></div>		266 <div id="8620c4b0-02c4-4fd1-8bf3-6086843551ac" class="map-canvas" style="height: 100%; width: 100%"></div>
280 <input name="__RequestVerificationToken" type="hidden" value="fFUd4+bKu5Tw33gxvFC7WMRQ9wQ3xQPlghttpODmWtE4- sep5D2rSLZAYeDNL4CDAxPurMyfK6sa2aXp5gdWBW2is477dp0_FzEw6XQTppEEI">		280 <input name="__RequestVerificationToken" type="hidden" value="KsKAvVK8m2Wh2ivsWdq1RH8TiFTDpCJDzCIBQIJH0V15iOQY2zBw2bi7lI8oNSFvd53dDr-t5zQsvXQrKnWv-jT2nvc- LzSDXiUwFHe01">

W3C compliance

Usage

- the operation on the pages based on the validation of collected pages against the WC3 standard
- a list of validation and/or warnings are presented in a form of list
- the W3C compliance feature does not allow to collect patterns

```
<collect>
  ...
  <source/>
  ...
</collect>
<compare>
  ...
  <source comparator="w3c-html5"/>
  ...
</compare>
```

For more information on W3C refer to:

https://validator.w3.org/docs/help.html#validation_basics

W3C compliance

Report

SOURCE W3C-HTML5

Validation errors count: 5

Validation warnings count: 1

No.	Validation Output
1	Line 388, column 1 Saw "<" when expecting an attribute name. Probable cause: Missing ">" immediately before. <pre>script> <erorTag < /body></pre>
2	Line 388, column 3 A slash was not immediately followed by ">". <pre>erorTag </b ody> <</pre>
3	Line 388, column 7 Element "erortag" not allowed as child of element "body" in this context. (Suppressing further errors from this subtree.) <pre>erorTag </body> </htm</pre>
4	Line 389, column 7 End tag for "html" seen, but there were unclosed elements. <pre></body> </html></pre>
5	Line 388, column 7 Unclosed element "erortag". <pre>erorTag </body> </htm</pre>
6	Line 388, column 7 Attribute "<" is not serializable as XML 1.0. <pre>erorTag </body> </htm</pre>

Status codes

Usage

- status response codes for the resource HTTP request are processed
- the collected status codes are processed only when they are from within the range defined in the Filter Range
- status Codes feature does not allow to collect patterns

```
<collect>
  ...
  <status-codes/>
  ...
</collect>
<compare>
  ...
  <status-codes/>
  ...
</compare>
```

For a detailed list of codes please refer to the Hypertext Transfer Protocol documentation at:

<http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html>

Status codes

Report

STATUS-CODES



No.	Status Code	URL
All gathered status codes:		
1	301	http://cognifide.com/contact-us
2	200	http://www.cognifide.com/contact-us
3	200	https://s.ytimg.com/yts/jsbin/www-embed-player-vflQLak8g/www-embed-player.js
4	200	https://s.ytimg.com/yts/jsbin/player-en_US-vflkXleCa/base.js
5	200	http://www.cognifide.com/%7E/media/cognifide2014/Sustainability/January%202016%20Amends/shutterstock_66595252.jpg?h=133&la=en&w=2000&hash=86F48BD8E632EB44BF2E5198786C6B34B76408E9
6	200	http://www.cognifide.com/%7E/media/Cognifide2015/shared/contacts/contacts.jpg?h=386&la=en&w=580&hash=7D95DF972B1B20C67CB79CD6958982BBD26C065C

Accessibility

Usage

- the operation on page code based on the validation of collected pages against one of the three conformance levels of the **WCAG 2.0 standard**
- it analyzes the results collected and validates it against the `html_CodeSniffer` library
- the accessibility feature does not allow to collect patterns

```
<collect>
  ...
  <accessibility standard="WCAG2AAA" />
  ...
</collect>
<compare>
  ...
  <accessibility/>
  ...
</compare>
```

For more details please refer to:

http://squizlabs.github.io/HTML_CodeSniffer/

Accessibility

Report

ACCESSIBILITY

Validation errors count: 6

Validation warnings count: 0

Validation notices count: 0

No.	Validation Output
1	<p>Line 22, column 5: This button element does not have a name available to an accessibility API. Valid names are: title attribute, element content.</p> <pre><button class="navbar-toggle" type="button" data-toggle="collapse"...ot;> </button></pre> <p>WCAC2A.Principle4.Guideline4_1_2.H91.Button.Name</p>
2	<p>Line 252, column 26: This select element does not have a name available to an accessibility API. Valid names are: label element, title attribute.</p> <pre><select multiple="" class="form-control"> <option>1</...<option>4</option> <option>5</option> </select></pre> <p>WCAC2A.Principle4.Guideline4_1_2.H91.Select.Name</p>
3	<p>Line 252, column 26: This form field should be labelled in some way. Use the label element (either with a "for" attribute or wrapped around the form field), or "title", "aria-label" or "aria-labelledby" attributes as appropriate.</p> <pre><select multiple="" class="form-control"> <option>1</...<option>4</option> <option>5</option> </select></pre> <p>WCAC2A.Principle1.Guideline1_3_1.F68</p>

Section 6.0

Advanced settings - exercises part I

Modifier

- a module responsible for converting the target before the data collection process is performed e.g.:
 - hiding a visible element
 - modifying a requested header
 - adding a new cookie



Hide Modifier

Background

- there are some dynamic elements on pages that look different each time the user visits the page e.g.:
 - news/article lists
 - animations
 - clock/data
 - exchange rates
 - weather forecast
 - advertisements
 - etc.



Hide Modifier

- responsible for **hiding an element** on a page so it is not processed by the tool
- hiding is done by setting css visibility property to hidden
- the user can hide many elements by defining many <hide> nodes.
- if xpath covers more than one element then all the elements that match defined xpath will be hidden



Hide Modifier

Sample use

```
<collect>
  ...
  <open/>
  ...
  <hide xpath="//*[@id='logo']"/>
  ...
  <screen/>
  ...
</collect>
```



Hide Modifier

Important information

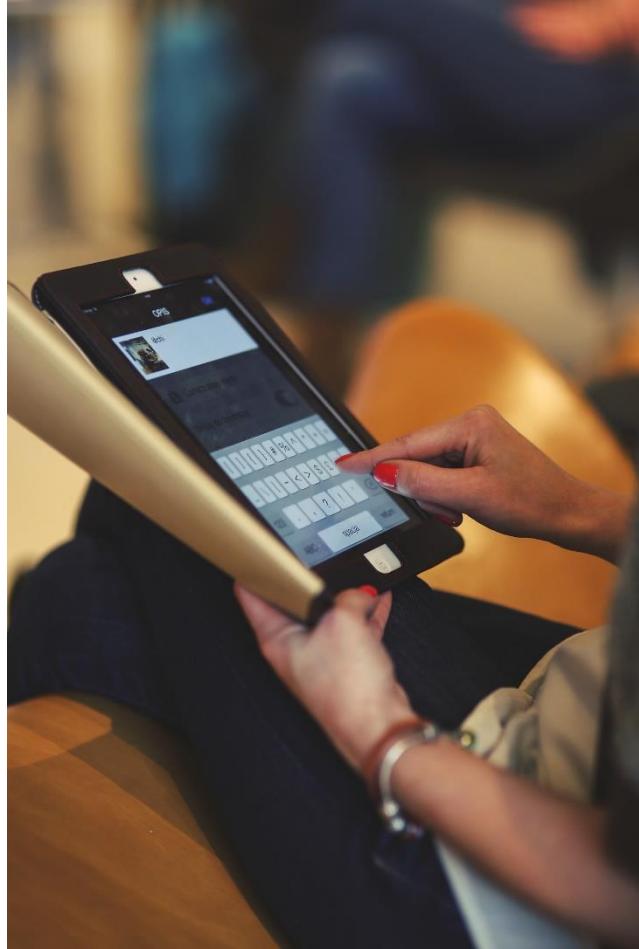
- the modifier must be declared after the open module in the test site XML definition



Resolution Modifier

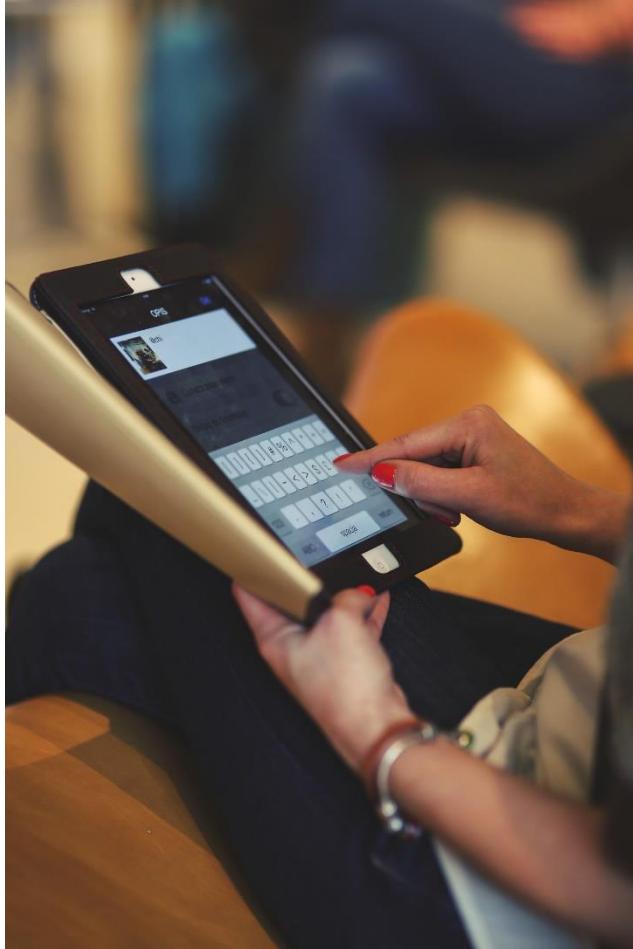
Background

- there are problems of making the same code work across multiple screen resolutions (inc. responsiveness) and checking it whenever a single change is introduced



Resolution Modifier

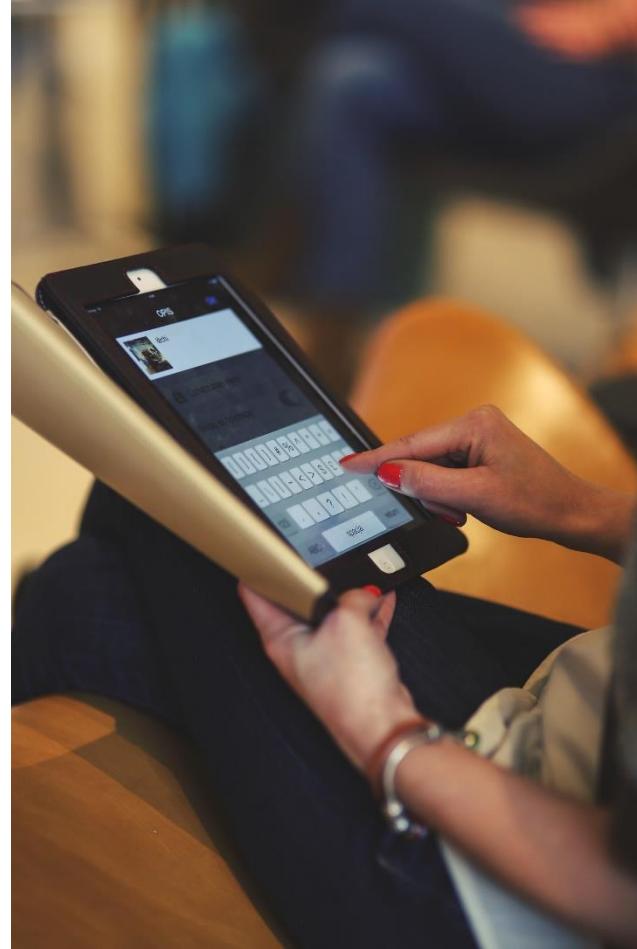
- responsible for changing browser screen size and thus simulating running the page on different viewports



Resolution Modifier

Sample usage

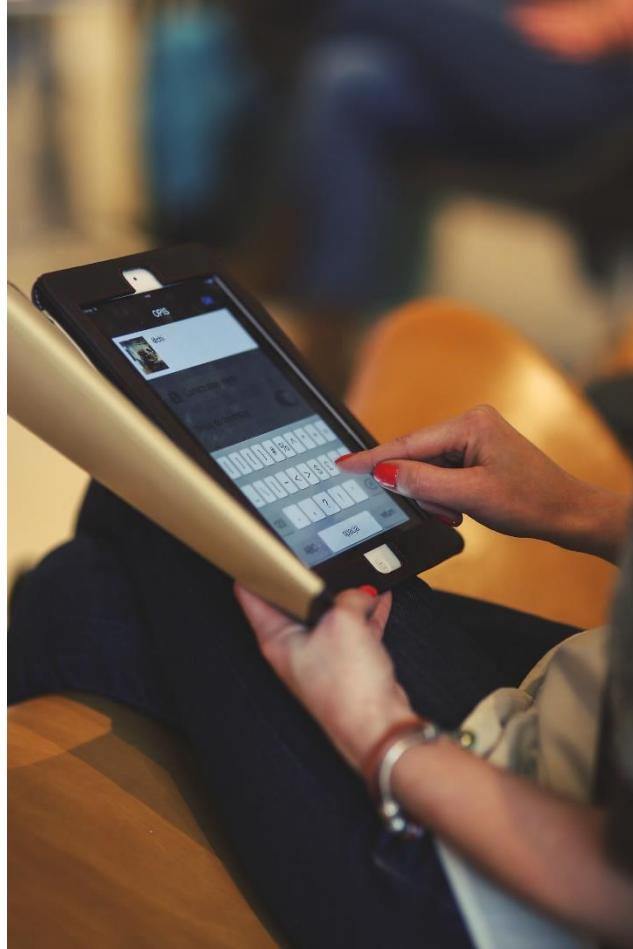
```
<collect>
  ...
  <resolution width="200" height="300"/>
  <screen/>
  ...
</collect>
```



Resolution Modifier

Important information

- you cannot maximize the window and specify the dimension at the same time
- if you specify the height parameter you have to also specify the width parameter and vice versa
- the **final resolution of screenshots may be different** when the scrollbar is displayed
- the default width of the Firefox Scrollbar is equal to 33px



Sleep vs. Wait For Page Loaded Modifier

Background

- very often there are page resources that need much time to load and it is impossible to test a page without waiting for them e.g.:
 - AJAX loaded elements
 - JavaScript loaded elements
 - heavy assets
 - etc.



Sleep vs. Wait For Page Loaded Modifier

Sleep Modifier

- responsible for ceasing test execution temporarily
- useful in situations when page resources need much time to load



Sleep vs. Wait For Page Loaded Modifier

Sleep Modifier – sample usage

```
<collect>
  ...
<open>
  ...
<sleep duration="3000"/>
  ...
</collect>
```



Sleep vs. Wait For Page Loaded Modifier

Sleep Modifier – Important information

- the sleep duration cannot be longer than 30000 ms (30 s)
- two consecutive sleep modifiers are not allowed
- the total sleep duration (sum of all sleeps) in test collection phase cannot be longer than 120000 ms (2 min)



Sleep vs. Wait For Page Loaded Modifier

Wait For Page Loaded Modifier

- it waits until the whole page is loaded (all DOM elements are loaded)
- it does not wait for dynamically loaded elements by e.g. JavaScript) or fixed amount of time is up



Sleep vs. Wait For Page Loaded Modifier

Wait For Page Loaded Modifier - sample usage

```
<collect>
  ...
  <open/>
  ...
  <wait-for-page-loaded/>
  ...
</collect>
```



Sleep vs. Wait For Page Loaded Modifier

Wait For Page Loaded Modifier

- the timeout for waiting is 10000 ms
- the page is checked every 1000 ms



Sleep vs. Wait For Page Loaded Modifier

So what is difference between

Sleep Modifier

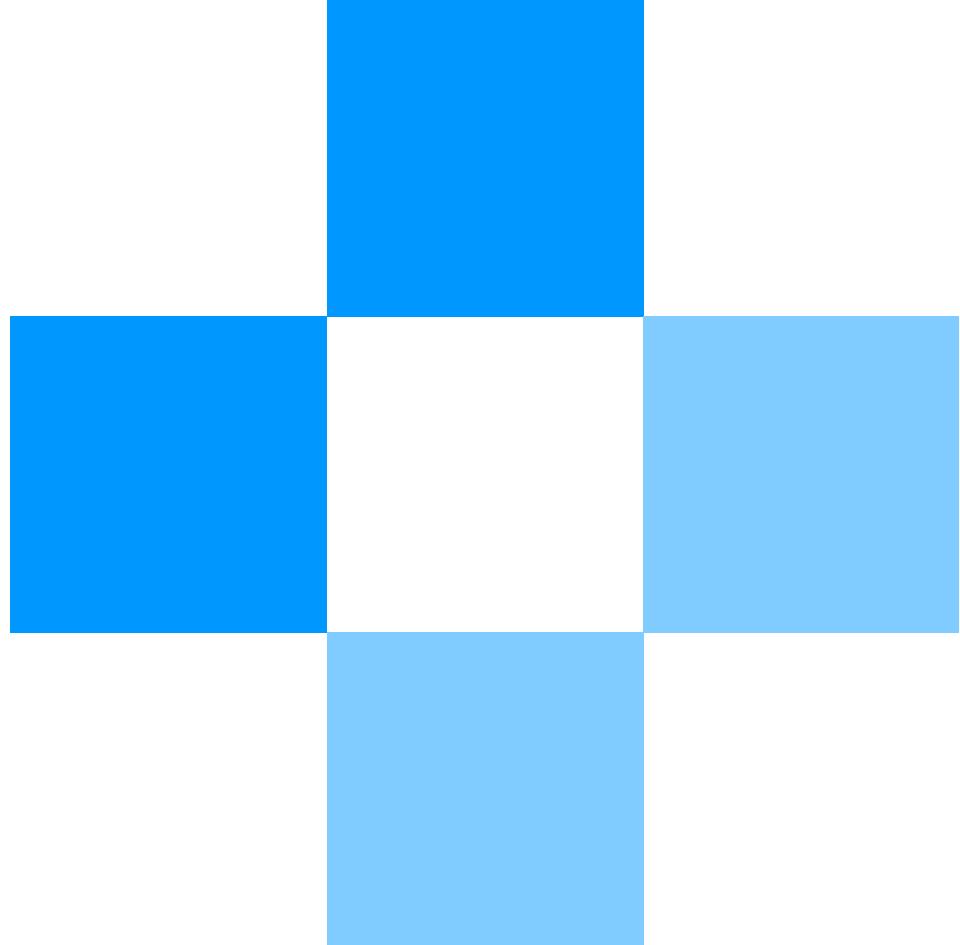
and

Wait For Page Loaded Modifier?



Section 5.0

Advanced settings - exercises part II



Cookie Modifier

Background

- in order to check certain behaviour of a page the user needs to provide certain pieces of information e.g.:
 - cookie disclaimer
 - localization
 - authorization
 - personalization



Cookie Modifier

- allows to **modify cookies** for a given page by adding or removing some cookies



Cookie Modifier

Sample usage

```
<collect>
  ...
  <modify-cookie action="add"
    cookie-name="sample-cookie"
    cookie-value="sample-cookie-value"/>

  <modify-cookie action="remove"
    cookie-name="another-cookie"/>
  ...
<open/>
  ...
</collect>
```



Cookie Modifier

Important information

- the modifier must be declared after the open module but before the Cookie Collector in the test site XML definition



Header Modifier

Background

- in order to check given behaviour of a page the user needs to define the operating parameters of an HTTP transaction e.g.:
 - basic authorization
 - user agent
 - geolocalization

nun incolabro grande con Pivencio, che haueva da Regnare in
dei S. honti et habebat un'Etate et 5. miliardi di lire. Et nel
mille novem mille Dolari, ma continuo habebat. Quan-
do non morì nre Dotti, e
mais ancora che della realete uedeva Christo in serua in
1970 - 710 milenario, con quel paseo. Per Gabriele, quando tra-
di apprezzava com'era stato in Cielo, quei milioni di lire eran
diciannove, un ventisei.
Dopo qui che pote decimo nell'Umore Sincato, obbligato
a regal suon. L'invia il Regno di Cristo, nel - mille
nato Segno come diceva l'aposto Petrus. E Ridoreva il
Libero non è male, la sincerità del male, uide che l'Umo per-
mette a conoscenza tutti i maliziosi nei secoli milenario, giusta
per la Chiesa piena felicità nel 7^{mo} milenario.
Diego Il Re venimento il 7^{mo} Nata. è un invito di Dio a
Demando, e vorrei d'averlo a Genti, che il Padre Segno e Masso
della sua vita fatto numerosi servizi nostro al invadere
la Greca, ma si apprende de Cielo, et domani oggi esce, et
in breve tempo succederà per il Giudizio universale, e dice che
non Pachacutec succederà, non fiori per il Giusti, se ga eviso
venireci per balsamo.
In die, da un ventisei di giorni a Cristo, ga intreto, han così fatto
tutte le Città, et fuc' bene ammirabile del Signore, ce n'era per
ogni campagna del Cielo, ma che poi non si vedevano le navi nel 7^{mo}
milenario nel cielo si uogliava, che ce intreto Dio. Li
dissevo poi: Signore, per il Signore, mentre il Signore siamo nelle
peccati. Prendi una cosa riguardo l'afro della nostra infelicità.
Per intreto fico il 7^{mo} milenario, riceviamoci al Cielo.
Sotto è 7^{mo} mese d'Anno. Cominciò nel suo loro, nel tempo che mi
son affannato a servirlo, fino al'ult'edizione, essendo lungo
senato con ciascuno de molti, e con apposito d'alcuna di
loro di mia conoscenza. Ogni conte. Che già mi uorrei fara.
Int'7^{mo} d'Anno cominciò tanti agi e guai altri. Ma non so
Signore di fico il 7^{mo} settembre, non facendone al Signore.
Int'7^{mo} en'odio, nel amore, ce dispiace il Signore.
C'è Gabriele e Damaso fuit'ing e scese in folla subito.

Jesu Christo Signori Noi. H. Maria eff.

Ad. de Gabriele anno 7. mense Sept.

Pre 17. Aut 7. a. Christo. Cea mea 8d.
7^{mo} mese d'Anno per Angelo Gabriele. Per me a Signore.
Per Gabriele, come or uidei, in miseria. A Signore Gabriele. Chi va
et domani. Chi fui. Chi fui. Chi fui. Chi fui. Chi fui. Chi fui.
Chi fui. Chi fui. Chi fui. Chi fui. Chi fui. Chi fui.
Int'7^{mo} mese d'Anno com'era. Chi fui. Chi fui.
Chi fui. Chi fui. Chi fui. Chi fui. Chi fui. Chi fui.
Chi fui. Chi fui. Chi fui. Chi fui. Chi fui. Chi fui.

Header Modifier

- responsible for injecting additional headers to a page before it is the subject of testing

non incalzando però un preludio, che haueva de regnare in
dei S. honti et habebat un' etate et l'ha regnata da 7 mili-
cento, et ha regnato molti dotti, ma continuo galibito. Quan-
do non morì nre Dottor S.
ma ancora che della regalme uedeva Christo in serua in
700 - 700 milenario, in quel paese, che Galles, qual'eta
di appartenenza non aveva, in Galles, que' milenio si vedea
che' l'ascensione, un veneto.
Discepi che' l'otto decimo nell' amore S. Petrus, obbediente
Regno fuori. L' invenne il Regno di Cristo, nel 7 milenario,
nato Regno come dicea l'apostoletico. e' Ridorevoso il
Libero non è male, la sincerità del male, uiva che libe per-
metta e consente tutti i maliziosi nei secoli milenario, perché
per la Chiesa paura galibito nel 7 milenario.
S. Petrus, che' l'otto decimo nel 7 milenario, è un'udienza di cosa il
Signore, e uorba di donar le genti, che il Signore, e' messo
della sua vita fatto numerosi benefici nostro al invader
la Grecia, ma' se l'apostolo diceva de Greci et Romani et così, et
in breve tempo successe per il Giudizio universale, e dice che
non Petrus resuscitò, non fiorì per il Giudizio, se già erano
resuscitati molti per Galileo.
In die, che' l'otto decimo in Christo, che' l'otto decimo, fanno credere
che il Signore, et gli altri apostoli del Signore, erano pur
segni compagno del Signore, ma' che poi non si vedevano le non nel 7 mil-
enario, nel quale si manifestava, che ce' s'aperto Porta Li-
bera per l'eterna, per il Signore, mentre il Signore siamo noi
ghetabbi. Dicono che' l'otto decimo l'aperto delle radie.
Per intanto fiorì il 7 milenario, resuscitato al Signore.
Questo è stato nel invito del Signore. Conditi, nel cibo loro, nel tempo che mi
son trattenevi il servizio, fino al'ult'edizione, essendo lungo
senato con auersione, se molte, e con apposizione, e alcuna si
erano de morte presenti, d'ogni sorte. Che' gl'eti mi uorba figura:
nra di mala conoscenza:
Int' 3 de genna auerbi conditi tanti aqua e piuma aloti. che' non so
figura di gto nre sette, non haudendo al'auerbi.
Int' 2 en odio, nel amore, ce' signori, che' nre.
Cui' Petrus, e' Demone, fuit in p'c'lo, et fuit in p'c'lo habbit.
S. Petrus, e' S. Pafaffini, Nro. 21. Maria eff.
Int' 3. de genna auerbi, che' nre.
Int' 4. Int' 5. e' S. Petrus, Cosa nre 80.
Int' 6. e' S. Petrus, Cosa nre 80.
Int' 7. e' S. Petrus, Cosa nre 80.
Int' 8. e' S. Petrus, Cosa nre 80.
Int' 9. e' S. Petrus, Cosa nre 80.
Int' 10. e' S. Petrus, Cosa nre 80.
Int' 11. e' S. Petrus, Cosa nre 80.
Int' 12. e' S. Petrus, Cosa nre 80.
Int' 13. e' S. Petrus, Cosa nre 80.
Int' 14. e' S. Petrus, Cosa nre 80.
Int' 15. e' S. Petrus, Cosa nre 80.
Int' 16. e' S. Petrus, Cosa nre 80.
Int' 17. e' S. Petrus, Cosa nre 80.
Int' 18. e' S. Petrus, Cosa nre 80.
Int' 19. e' S. Petrus, Cosa nre 80.
Int' 20. e' S. Petrus, Cosa nre 80.
Int' 21. e' S. Petrus, Cosa nre 80.
Int' 22. e' S. Petrus, Cosa nre 80.
Int' 23. e' S. Petrus, Cosa nre 80.
Int' 24. e' S. Petrus, Cosa nre 80.
Int' 25. e' S. Petrus, Cosa nre 80.
Int' 26. e' S. Petrus, Cosa nre 80.
Int' 27. e' S. Petrus, Cosa nre 80.
Int' 28. e' S. Petrus, Cosa nre 80.
Int' 29. e' S. Petrus, Cosa nre 80.
Int' 30. e' S. Petrus, Cosa nre 80.
Int' 31. e' S. Petrus, Cosa nre 80.
Int' 32. e' S. Petrus, Cosa nre 80.
Int' 33. e' S. Petrus, Cosa nre 80.
Int' 34. e' S. Petrus, Cosa nre 80.
Int' 35. e' S. Petrus, Cosa nre 80.
Int' 36. e' S. Petrus, Cosa nre 80.
Int' 37. e' S. Petrus, Cosa nre 80.
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Int' 45. e' S. Petrus, Cosa nre 80.
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Int' 49. e' S. Petrus, Cosa nre 80.
Int' 50. e' S. Petrus, Cosa nre 80.
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Int' 62. e' S. Petrus, Cosa nre 80.
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Int' 64. e' S. Petrus, Cosa nre 80.
Int' 65. e' S. Petrus, Cosa nre 80.
Int' 66. e' S. Petrus, Cosa nre 80.
Int' 67. e' S. Petrus, Cosa nre 80.
Int' 68. e' S. Petrus, Cosa nre 80.
Int' 69. e' S. Petrus, Cosa nre 80.
Int' 70. e' S. Petrus, Cosa nre 80.
Int' 71. e' S. Petrus, Cosa nre 80.
Int' 72. e' S. Petrus, Cosa nre 80.
Int' 73. e' S. Petrus, Cosa nre 80.
Int' 74. e' S. Petrus, Cosa nre 80.
Int' 75. e' S. Petrus, Cosa nre 80.
Int' 76. e' S. Petrus, Cosa nre 80.
Int' 77. e' S. Petrus, Cosa nre 80.
Int' 78. e' S. Petrus, Cosa nre 80.
Int' 79. e' S. Petrus, Cosa nre 80.
Int' 80. e' S. Petrus, Cosa nre 80.
Int' 81. e' S. Petrus, Cosa nre 80.
Int' 82. e' S. Petrus, Cosa nre 80.
Int' 83. e' S. Petrus, Cosa nre 80.
Int' 84. e' S. Petrus, Cosa nre 80.
Int' 85. e' S. Petrus, Cosa nre 80.
Int' 86. e' S. Petrus, Cosa nre 80.
Int' 87. e' S. Petrus, Cosa nre 80.
Int' 88. e' S. Petrus, Cosa nre 80.
Int' 89. e' S. Petrus, Cosa nre 80.
Int' 90. e' S. Petrus, Cosa nre 80.
Int' 91. e' S. Petrus, Cosa nre 80.
Int' 92. e' S. Petrus, Cosa nre 80.
Int' 93. e' S. Petrus, Cosa nre 80.
Int' 94. e' S. Petrus, Cosa nre 80.
Int' 95. e' S. Petrus, Cosa nre 80.
Int' 96. e' S. Petrus, Cosa nre 80.
Int' 97. e' S. Petrus, Cosa nre 80.
Int' 98. e' S. Petrus, Cosa nre 80.
Int' 99. e' S. Petrus, Cosa nre 80.
Int' 100. e' S. Petrus, Cosa nre 80.

Header Modifier

Sample usage

```
<collect>
  ...
  <header key="Authorization" value="Basic
emVuT2FyZXVuOnozbkdAckQZbiE="/>
  ...
<open/>
  ...
</collect>
```

non includendo però un Prencipe, che haueva de Regnare in
dei S. honti et habebat un filio, et il So. gto. in Dio e' no-
cento, et s'asceggeva d'esso che la regno ad occhi suoi, et non
e'ut n'essere morto ne' doct. E
ma' ancora che della regna t' uedeva Christo in serua in
1000 e' no. millesimo, in quel paese. Per Gabriele quidam
bis appartenente secum curva in Cibis, que matrem suam sed uis
et' Ascensionem, in ventre suo
Disce qui che pote decimo nell' amore Simeone, obuenio
Regno suu. L' uideva il Regno di Christo, nel - mille.
natio Regno come diceva l' agnus dilectus. e' Ridoreca, il
Libera non è nulla, in vicenda de male, uro che libra per
metta e' ammendata esse in malo ne' sei millesimo, giusta
per la Chiesa piena felicità nel 7^{mo} millesimo.
Simeone. Si' decimato il 7^{mo} Nol. si' ammendata de nona il
Decimo, e' uorba d' esser lo Gentile che il Puglio fogli e' masso
della sua vita fatto numerosi bendy uerano al invader
la Grecia, ma' he' ap' decimato de Cibis et decimato est, et
in oreo tempo succederà per il Giudicio universale, e' dice Ag-
ostino Pachomio secundo, non feso per il Puglio, se ga evan-
nesciati pugli per Gallo.

In die, da' uimenti di quei in Christo, ga' intrezzo, han' cosi fatto
che il Puglio e' fio' dei campanili del cielo, e' anco' par-
so' seni compagno del Cibo, ma' che poi non si' godenari le non nel 7^{mo}
millesimo nel quale si' significava, che ee' intrezzo Puglio.
Puglio con' Atena, e per il Cibo, mentre il Cibo siamo nello
schiambo. Dicendo che cosa risguarda l' effetto delle prediche.
Per intrezzo feso il 7^{mo} millesimo, riscrivendo al Cibo.
Soto è 7^{mo} in invito dal Puglio. Conditi, nel cito loro, nel tempo che mi-
son battimenti e' servito, fino al' uita' letitiae, essendo lungo
senecta' con' auersione de molte, e' con' offerta d' alcuna. Si'
erano de molta presentia d' ogni sorte. Che glie' mi' uorba figura:
nuto de' mia conoscenze.

Int' 7^{mo} anno, quando tam aquil a' quam alio. v'glie' non so
figura di gto. 7^{mo} setto, non hauidone al' uocazione.

Int' 7^{mo} anno, et alio, ce' d'figo. 7^{mo} setto.

Cibis Puglio e' dimisus fuit imp' e' scelz' in fido' subdit.

Simeone. Gt. Simeone. Nol. 7^{mo}. Maria eff.

Int' 7^{mo} anno, e' m' ingred.

Int' 7^{mo} anno, et 7^{mo} a. Simeone. Cibis m' 8^{mo}.
7^{mo} anno, et 7^{mo} a. Simeone. Cibis m' 8^{mo}.
Per' generali proprie' com' er' ubiq' in mezo, il Puglio Gabriel Ghisi, va'
et' D'Orbalioli, Cibis 7^{mo} a.
et' Cibis, cui' d'oltre, uerano, e' servito' Deum, q' forse' uer' ecclesie
suo' excepit, q' fuit' Deum.

Int' 7^{mo} anno, et 7^{mo} a.
Puglio, non co' m' ingred. E' che il Puglio uer' in formar' per' regnare
D'Orbalioli, nella Scola di S. Teodosio, nella fine del meso di Augo-

Header Modifier

Important information

- it must be declared before the open module in the test suite XML definition and the proxy must be used

non incalzando però un preludio, che haueva de regnare in
dei S. honti et habebat un filo, et l'ha de far in Dio e no-
cento, et sconçorci d'anno per la pugna ad oculi eoy, et non
moia ancora che della scelta uedeva Christo seruo in
1000 e 700 millesimi, in quel paese. Poi Gabriele quidam
bis appartenente ramo curvato in Cib, que madonna sedet
e' su' Ascensione, in venetijs.
Diego qui ha fatto discorsi nell' amore S. Petruccio, obbligato
Rochefoucaul. L'insiste il Regno di Cristo, nel 7 millesimo
anno. Segno come dicea l'apostoletico. e' Ridoreau, il
Libero non è nullo, in vicenda de male, uero che libo per
mea e' conquisita, e' uero in se' millesimi, giusta
per la Chiesa piena felicità nel 7 millesimo.
Diego. Si è terminato il 7 millesimo anno. si è cominciato di nuovo il
7 millesimo, e' uerissimo di Dio lo Gentile, che il Signore oggi è messo
della sua vita, fatto numeroso servito nostro al invadere
la Grecia, ma si è per le deuances de Dio, et devozione suo, et
in breve tempo succedea per il Giudicio universale, e dice che
non Pachecuccio succederà, non fero per il Giudice, se ga evane
renunciati moglie per balaia.
In die, da' i meriti di Gesù Christo, ga intreto, fano cosi fatto
che Dio l'invia, et fico bene ammirabile del Signore, et ammirabil
seni compagno del Signore, ma che poi non si godessero le non nel 7 millesimo
anno, nel quale si è uisificata, che ce' intreto. Dio. Li
Signore poi, stava, per il Signore, mentre il Signore siamo nelle
peccati. Dicono, voi cosa risguarda l'opere delle vostre life?
Per intreto, per il Dio 7 millesimo, riscriviamo al Signore.
Sotto è 7 millesimo dal Signore. Conditi, nel cito loro, nel tempo che mi
son trattenuuti a servirlo, fino al'ult'edizione, essendo lungo
setento con duecento, de molte, e con approssimazione di alcuna di
ciascuna de molte presenti, d'ogni conto. Che già mi uorrei far jura:
nato di mia conoscenza:
Int' 7 de gennaio, quando tam aquo e' quam alter. Vgl non so
Signore di Dio 7 millesimo, non facendone al Signore.
Int' 7 en' adio, nel amore, ce' signore. Poi ricevi.
Cuius Gabriele et Demetrio fuit in' 7 millesimo in fiducia.
Soforo Fr. Soforino Nov. 7. Maria eff.

Anno de Signore anno 7 millesimo.

Die 12. Anno 7 millesimo. Etiam m. 80.
700 millesimo. Poco tempo dopo, Angelo Gabriele dom. 7 millesimo.
Vic' generali. Graft, corona e' uobis, in mezzo a' fiori Gabriel Ghisi, va'
et dono Gabriele. Quel fiori, et bis, et an' fiori. 700 millesimo. Incaricata ecce per
v. Carissimi, qui dicitur S. uerba, e' veritate Deum, q' forse uerba ecce
sai, excepit fidei fidei. Deum.

Int' 7 millesimo, nel qual anno con me' fiori 700 millesimo.
Poi don co' m' uocatio. E che l'U. fiori uerba formata, per regol' 700 millesimo.
Dell'Alfieri, nella Scuola di S. Teodoro; nella fine del mese di Augo

Click Modifier

Background

- in order to check certain behaviour of a page the user needs to click a given element on this page e.g.:
 - accordion component
 - tabs component
 - expandable menu (dropdown list)
 - lightbox



Click Modifier

- allows to perform the click action on a page element



Click Modifier

Sample usage

```
<collect>
  <open/>
  ...
  <click
    xpath="/*[@id='menu']"
    timeout="3000"/>
  ...
<screen/>
  ...
</collect>
```



Click Modifier

Important information

- note that when element is not found (e.g. by improper xpath value) warning will be logged but test will be passed to the next steps
- the modifier it must be declared after open module in test suite XML definition
- the element to be clicked **must be visible** at the moment of performing the click action



Section 6.0

Result analysis, test stabilization

Result analysis and test stabilization

- what are the problems that you come across?
- what conclusions can we draw?



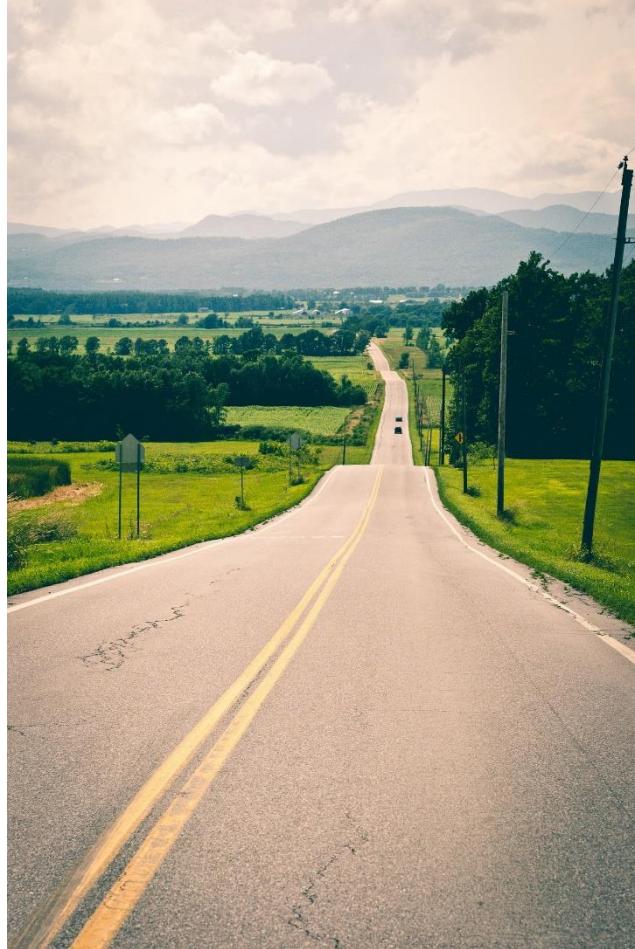
Section 7.0

AET roadmap

AET roadmap

What's next?

- stabilization
- UX improvements for the report
- Selenium grid
- expand the range of browsers supported
- light and more scalable architecture
- ...

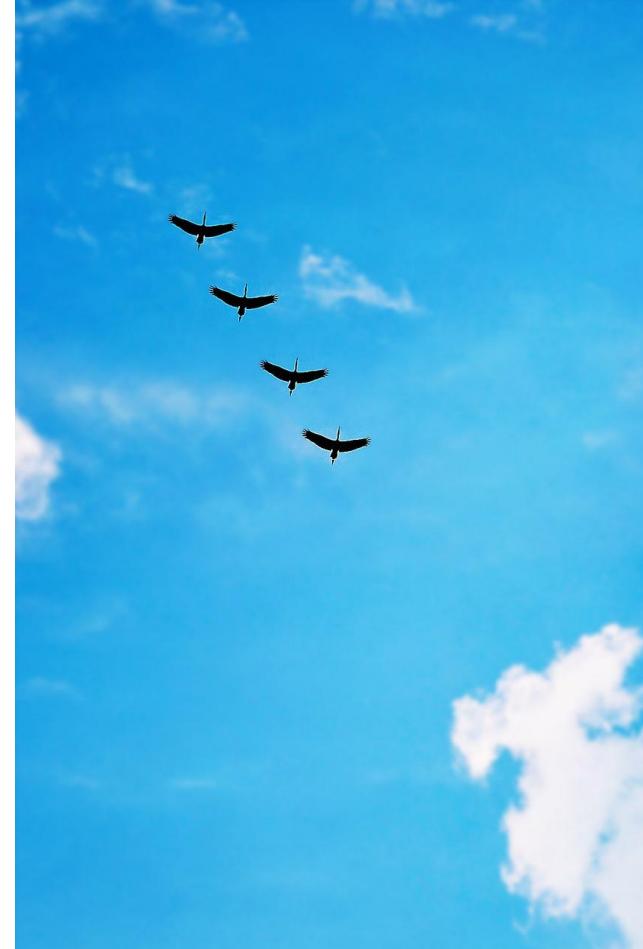


Section 8.0

Workshop summary

Workshop summary

What you should have learned from this workshop



Q & A

Thank you!

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References

<https://github.com/Cognifide/AET>

<http://www.cognifide.com>

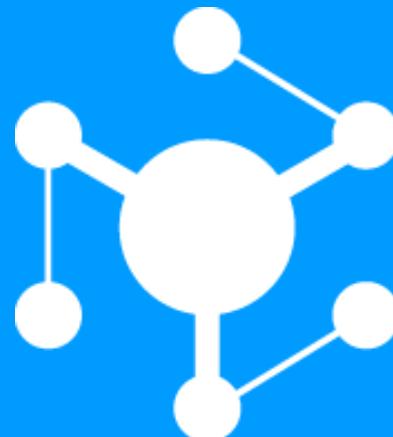
https://validator.w3.org/docs/help.html#validation_basics

<http://www.w3.org/Protocols/rfc2616/rfc2616-sec10.html>

http://squizlabs.github.io/HTML_CodeSniffer/

<https://github.com/Cognifide/bobcat>

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aet