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Cybage Software Pvt. Ltd.

# Automation using Selenium

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- ✓ **What is Selenium ?**
  - Selenium Components
  - Advantages of Selenium
  - Selenese-The language of Selenium
- ✓ **Automating Tests using Selenium**
  - Prerequisites and Test Bed Setup
  - Scripting Techniques and Best Practices
- ✓ **Known Issues & Workarounds**
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  - Source Repository
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  - Selenium Developer Forums
  - Selenium-How to Contribute

# What is Selenium ?



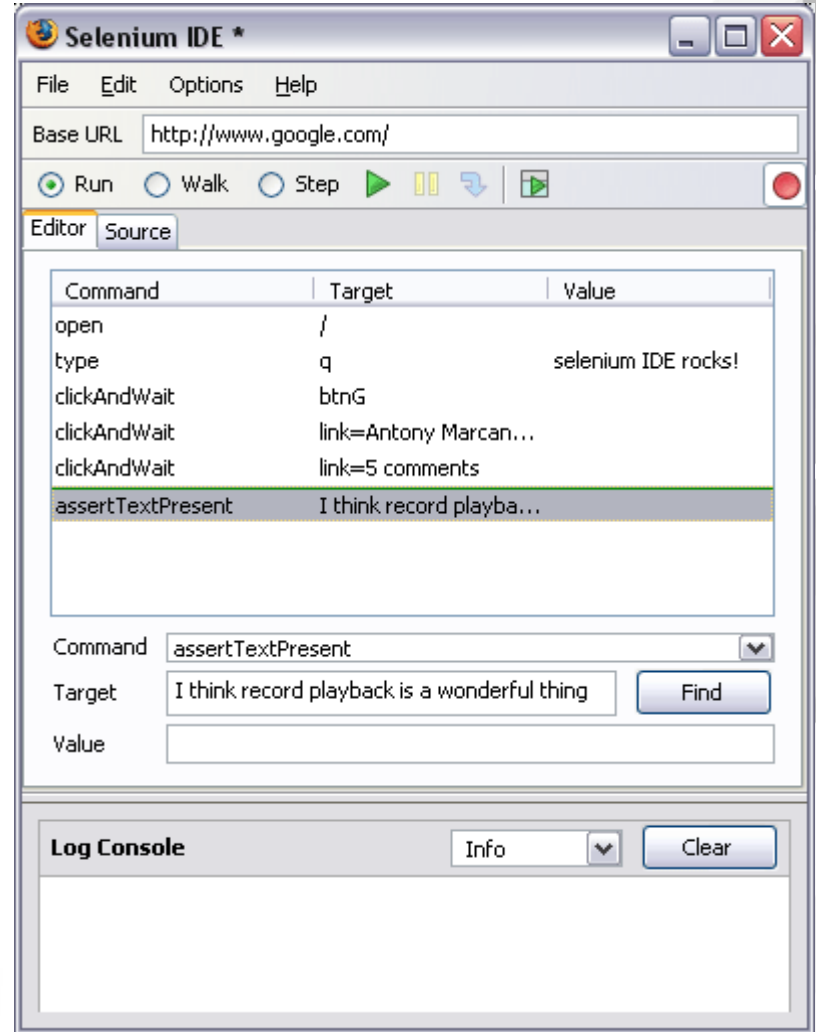
- Automation tool for web based applications
- Used for functional regression testing
- Uses JavaScript
- Embeds test automation engine in your browser

## 1. Selenium Core

- Core engine of Selenium
- JavaScript/DHTML library
- Other Selenium components such as IDE and RC build on it
- Supports a variety of platforms
  - Windows: Internet Explorer 6.0 and 7.0 , FireFox 0.8 to 2.0
  - Mac OS X: Safari 2.0.4+, FireFox 0.8 to 2.0 , Camino 1.0a1
  - Linux: FireFox 0.8 to 2.0 Konqueror

## 2. Selenium IDE

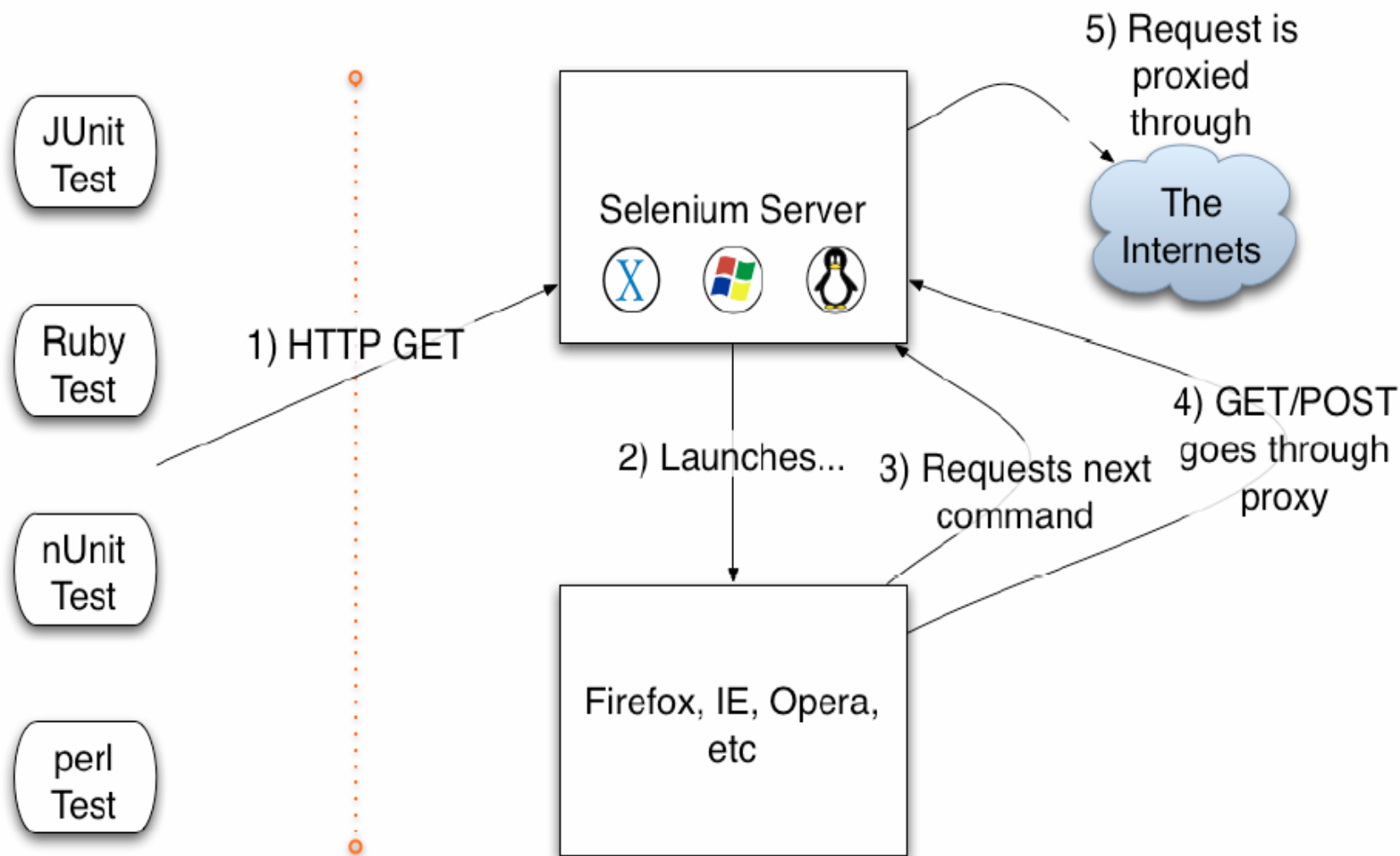
- Integrated development environment for Selenium tests
- Enables you to record a browser session
- Implemented as a Mozilla FireFox extension
- Allows you to record, edit, and debug tests.



## 3. Selenium Remote Control (RC)

- Provides Selenium Server
- Start/Stop/Control supported browsers
- Script web application UI tests
- Works with any HTTP website
- Uses any JavaScript enabled browser





- Open source, free software
- Easy Installation
- Scripting Techniques :
  - Easy recording and playback of scripts
  - Modular scripts
- Compatibility :
  - Multiple operating systems (Windows, Linux, Mac)
  - Allows cross browser testing (Record in FireFox, execute in IE)
- No dedicated machine required for test execution (user can work in parallel).
- Integration with third party tools.
  - Example : RTH Test Case Management Tool.

Selenese consists of Actions, Accessors, Element Locators and Variables

- Actions - Commands for the selenese language to perform an action on a web application
  - Script performs a particular action
  - Typically take element locator and possibly a value
  - Examples :
    - 1.Open- open a url
    - 2.Click- click button, link, etc..
    - 3.Type- type text in text field

- Accessors – Verification / Validation checkpoints for the tool
  - Data related
  - Take only element locators
  - Examples :
    1. store(locator,variable)
    2. verify(locator,pattern)
    - 3.eval- return value of JS expression
    4. bodyText-contents of HTML body

# Selenese-The language of Selenium

- Element Locators
  - These can be id, name, identifier, link, etc..
  - Variables used in scripting
- Information regarding Actions, Accessors can be found in class ‘Selenium Driver’ in installed directory  
For e.g. `C:\Selenium\selenium-remote-control-0.9.0\ruby\doc\index.html`

```
require "selenium"
require "test/unit"

def test_new
  @selenium.open "/"
  @selenium.type "q", "Hello"
  @selenium.click "btnG"
  @selenium.wait_for_page_to_load "30000"
  begin
    assert @selenium.is_text_present("Hello is a new way to look at
    pictures with friends and family. )
  rescue Test::Unit::AssertionFailedError
    @verification_errors << $!
  end
  temp = @selenium.get_text("//div[2]/div[1]")
end
end
```

# Automating Tests using Selenium

## ➤ Software :

- Selenium IDE, Mozilla FireFox for script recording
- Selenium Server, Java for running scripts

## ➤ Configuration :

- Set path variables
- Use `-multiWindow` option while starting server

## ➤ Resource :

- Users... should have basic scripting knowledge
- Hardware... No specific requirement the basic configuration for a server – P4, 512 MB RAM is good enough.



In order to ensure the quality of scripts and reduce maintenance, it is best to have scripting techniques and best practices. Some of which are...

- Comments and proper formatting in scripts
- Scripting considerations for integration with other tools
- Documentation of basic data required for scripts
- Documentation of new functions added for scripts
- Follow fixed, logical scripting format
- Include code to handle Selenium errors
- Scripting according to application specific issues

# Known Issues & Workarounds



## Potential Causes :

- Can happen due to execution speed of Selenium
- Elements do not load on page in time

## Fix :

- Add code in scripts which waits for elements

## Additional issues :

- Sometimes existing elements on a page are not detected
- Sometimes elements on a page have a same label

## Solution :

- Obtain exact element label from source code
- Label can be used in scripts for accuracy

# Handling of Popup windows

## Steps :

- Window id required for automated operations in window
- At times if id is not obtained during recording, go to window and perform operations
- Window id will be obtained after this action.

# Handling of Frames

## Option :

- -multiWindow option handles potential frame problems

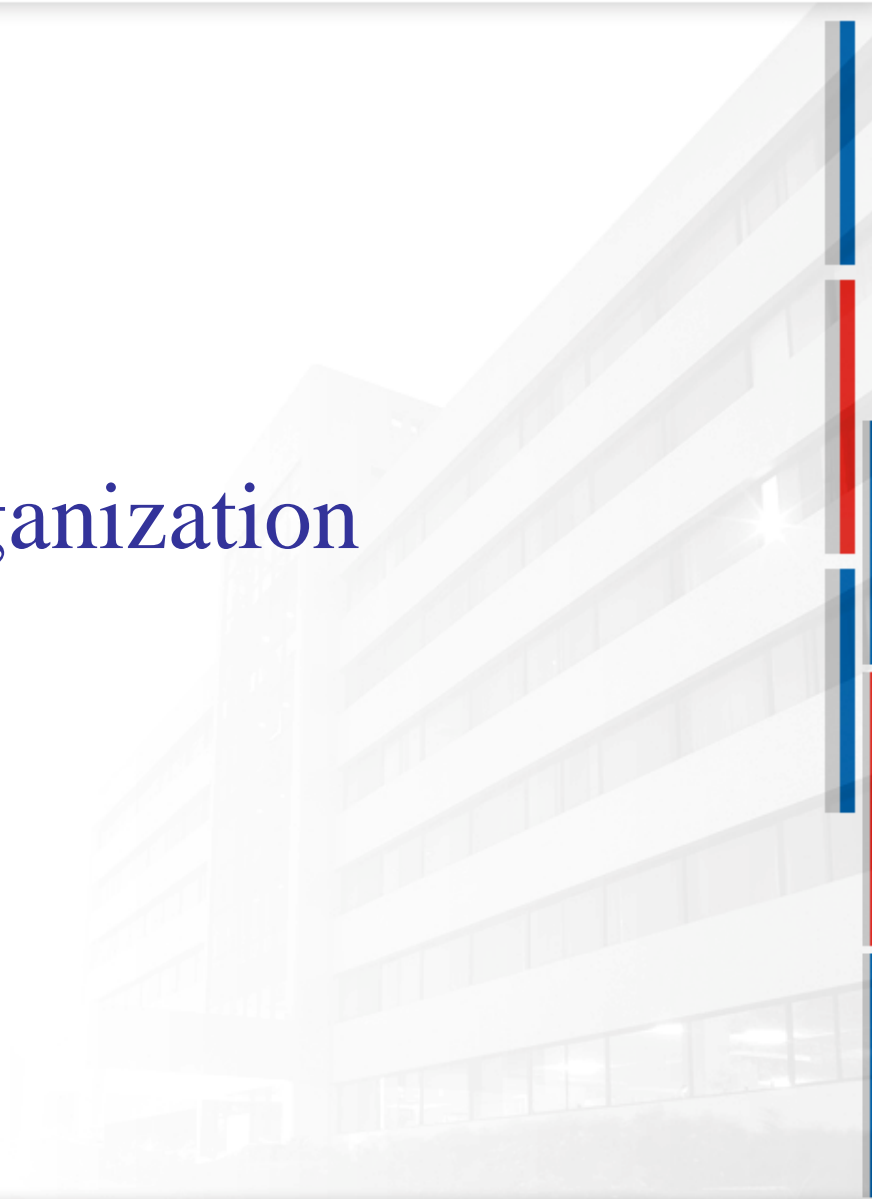
## Causes :

- At times required name of frame not obtained in recording

## Fix :

- Obtain frame label from source code
- Also can be obtained from browser URL bar

# Benefits to Organization



## ➤ Automation Benefits :

### ➤ Usual benefits for automation e.g. Time saving

- Time required for sanity reduced ( 12 man hours to 3 man hours, build frequency of 4-5 builds a month )
- For one of the projects, Sanity suite automated : 243 test cases

### ➤ Good Returns on Zero Investment

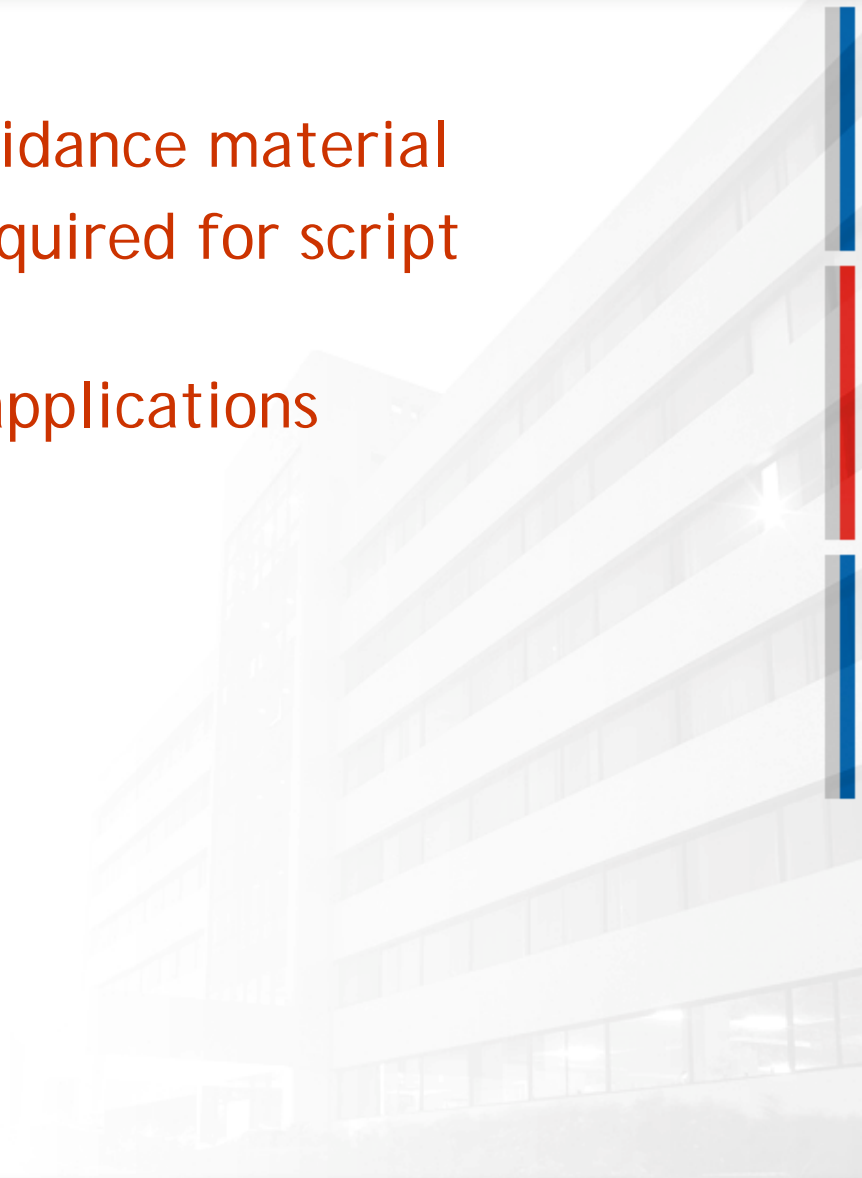
## ➤ Increasing Productivity

- Cost saving as it is open-source
- QA engineers get familiar with scripting languages like Ruby, Perl etc apart from manual testing

## ➤ Caveat:

- Full automation and maintenance has not been evaluated and that can be a risk

- Lack of exhaustive formal guidance material
- Mozilla FireFox browser is required for script recording
- Only works with web based applications





# Selenium Reference on the Internet



- **View :** <http://svn.openqa.org/fisheye/viewrep/selenium-core/trunk>
- **To check out Selenium Core: svn co**  
<https://svn.openqa.org/svn/selenium-core/trunk>

- Selenium Core  
<http://forums.openqa.org/forum.jspa?forumID=3>
- Selenium IDE  
<http://forums.openqa.org/forum.jspa?forumID=2>
- Selenium RC  
<http://forums.openqa.org/forum.jspa?forumID=13>

- <http://forums.openqa.org/forum.jspa?forumID=4>
- Post suggestions, feature requests, patches, etc..
- Development mailing list : [selenium-core-dev-subscribe@openqa.org](mailto:selenium-core-dev-subscribe@openqa.org)
- Send emails in plain text format only

## QA/User Contribution :

- Submit bug reports , with patches
- Helping out in forums

## Development :

- Becoming a regular Selenium developer is on invite-only basis

## Questions



**Thank You !!!**