SOFTWARE QUALITY ASSURANCE

Lecture 14-B (Tools)

The Last Lecture ☹

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The University of Lahore

Switch off mobile phones during lectures, or put them into silent mode

RESPECT!!!

Believe

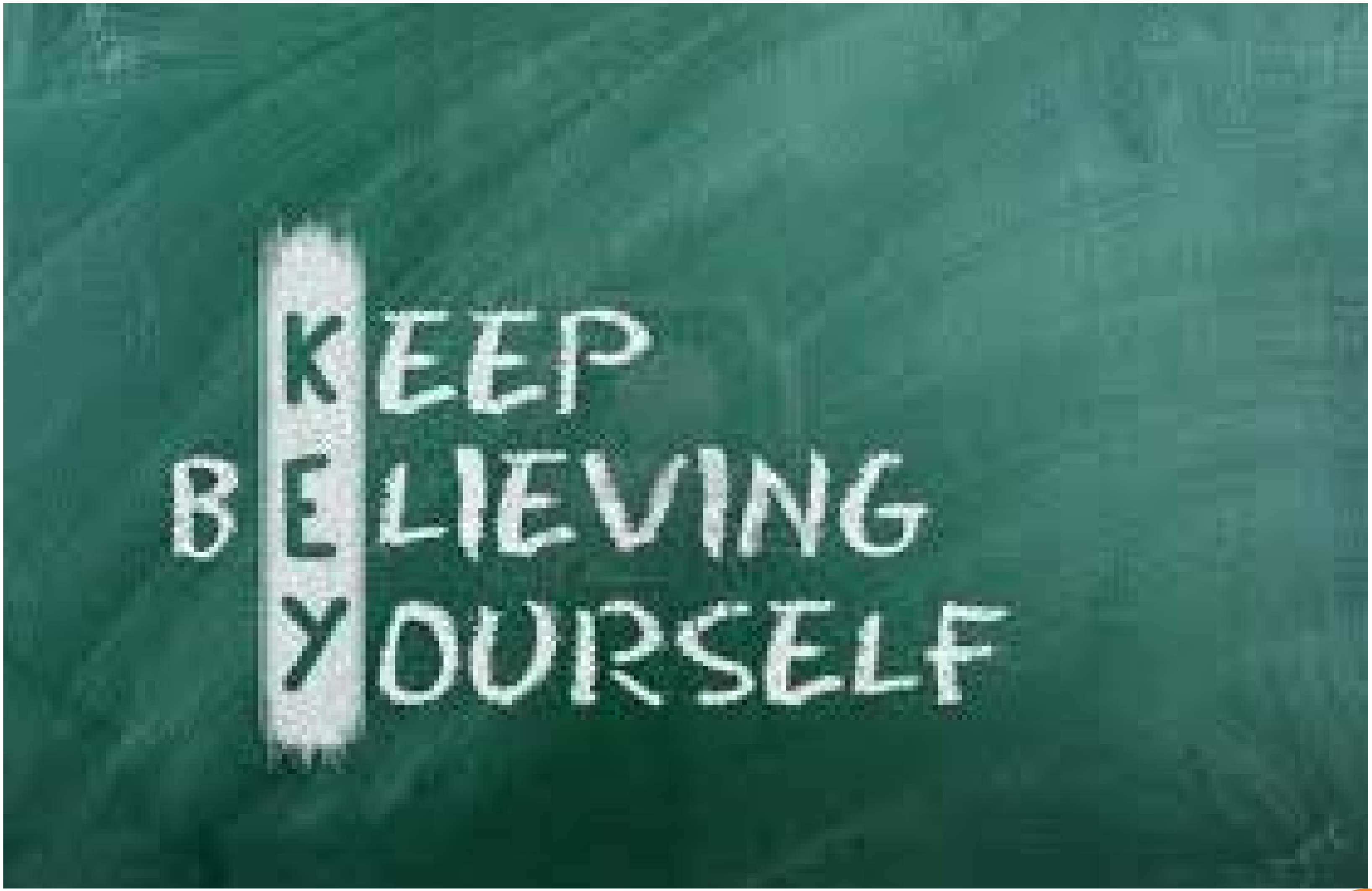
in yourself,

Others

will follow

IF YOU *Believe* IN YOURSELF

Anything IS POSSIBLE


KEEP
BELIEVING
YOURSELF

What is Test Automation?

- A process of writing a computer program to do testing that would otherwise need to be done manually
- Use of software to control the execution of tests

Two types of test automation:

- Code-driven testing
- Graphical user interface testing

Why and When To Automate?

- Frequent regression testing
- Repeated test case Execution is required
- User Acceptance Tests
- Faster Feedback to the developers
- Reduce the Human Effort
- Test same application on multiple environments

Advantages of Automation

- *Reliable*: Tests perform precisely the same operations each time they are run, thereby eliminating human error.
- *Repeatable*: You can test how the software reacts under repeated execution of the same operations.
- *Reusable*: You can reuse tests on different versions of an application, even if the user interface changes.
- *Speed*: Run tests significantly faster than human users.
- *Cost Reduction*: As the number of resources for regression test are reduced.
- *Better Quality Software*: Rapid feedback to developers during the development process as a result of frequent regression testing.

Disadvantages of Automation

- Proficiency is required to write the automation test script.
- Debugging the test script is major issue. If any error is present in the test script, sometimes it may lead to deadly consequences.
- Test maintenance is costly in case of playback methods. Even though a minor changes occurs in the GUI, the test script has to be rewritten.
- Maintenance of test data files is difficult, if the test script tests more screens or web-pages.
- Short iteration or very tight deadline, there is not enough time to build test automation.

Test Automation Tools

- Quick Test Professional By HP
- HP Load Runner
- Rational Functional Tester By Rational (IBM Company)
- Silk Test By Borland
- Test Complete By Automated QA
- QA Run (Compuware)
- Watir (Open Source)
- Selenium (Open Source)
- Sahi (Open Source)

What is Selenium?

A set of tools that supports rapid development of test automation for web-based applications.

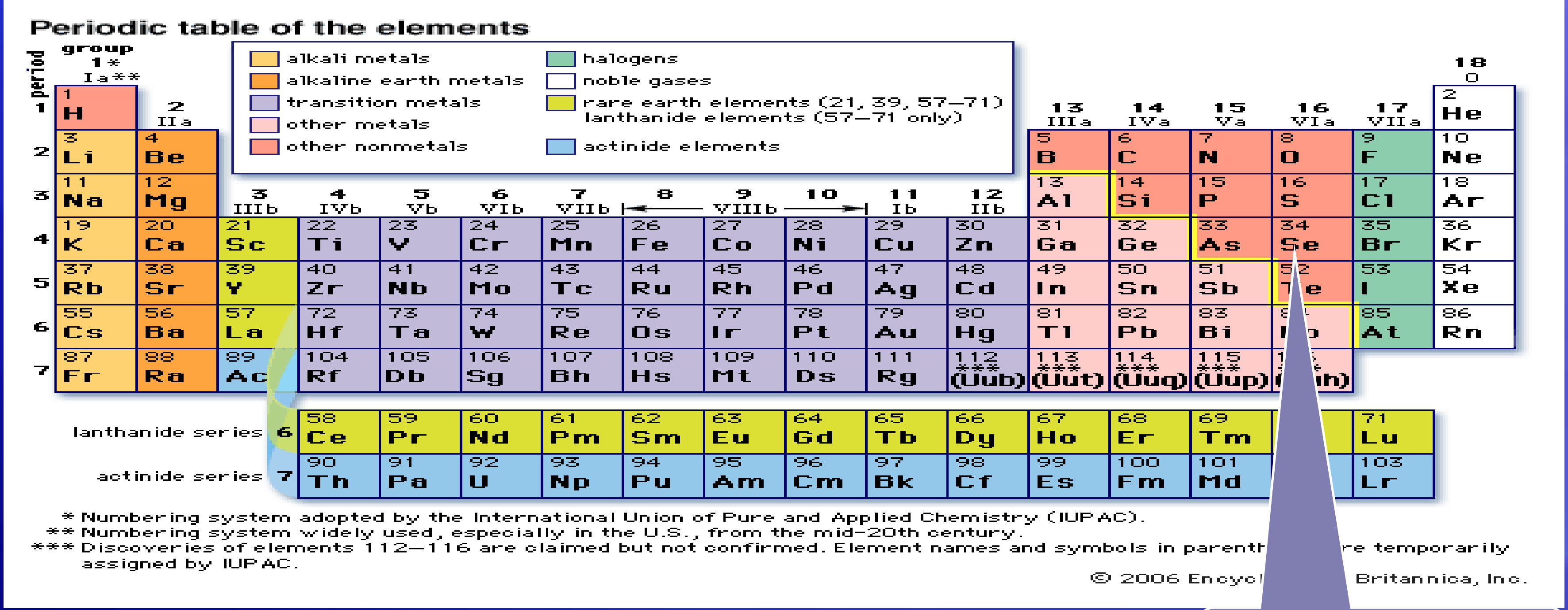
- Can be recorded and written as HTML
- Support for a number of programming languages: Java, C#, Perl, PHP, Python, Ruby
- Cross browsers support: IE, Firefox, Opera, Safari and Google Chrome
- Cross platform support: Windows, Linux, and Macintosh.

Selenium Background

- Invented in 2004 by Jason R. Huggins and team.
- Originally named JavaScript Functional Tester [JSFT]
- 100% Javascript and HTML
- Designed to make test writing easy
- Open source browser based integration test framework built originally by ThoughtWorks
- Selenium is open source software, released under the Apache 2.0 license and can be downloaded and used without charge.

Story about Selenium

- Selenium is a chemical element with the atomic number 34, represented by the chemical symbol Se. It is a nonmetal, chemically related to sulfur and tellurium, and rarely occurs in its elemental state in nature.



Periodic table of the elements

- 🟨 alkali metals
- 🟧 alkaline earth metals
- ▨ transition metals
- □ other metals
- 🟥 other nonmetals
- 🟩 halogens
- □ noble gases
- 🟨 rare earth elements (21, 39, 57–71)
lanthanide elements (57–71 only)
- 🟦 actinide elements

period	group 1* Ia**	2 IIa	3 IIIb	4 IVb	5 Vb	6 VIb	7 VIIb	8	9 VIIIb	10	11 Ib	12 IIb	13 IIIa	14 IVa	15 Va	16 VIa	17 VIIa	18 0
1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	8 [illegible]	85 At	86 Rn
7	87 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 *** (Uub)	113 *** (Uut)	114 *** (Uuq)	115 *** (Uup)	1 [illegible]h)		

lanthanide series 6	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm		71 Lu
actinide series 7	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md		103 Lr

* Numbering system adopted by the International Union of Pure and Applied Chemistry (IUPAC).
** Numbering system widely used, especially in the U.S., from the mid-20th century.
*** Discoveries of elements 112–116 are claimed but not confirmed. Element names and symbols in parenth re temporarily assigned by IUPAC.

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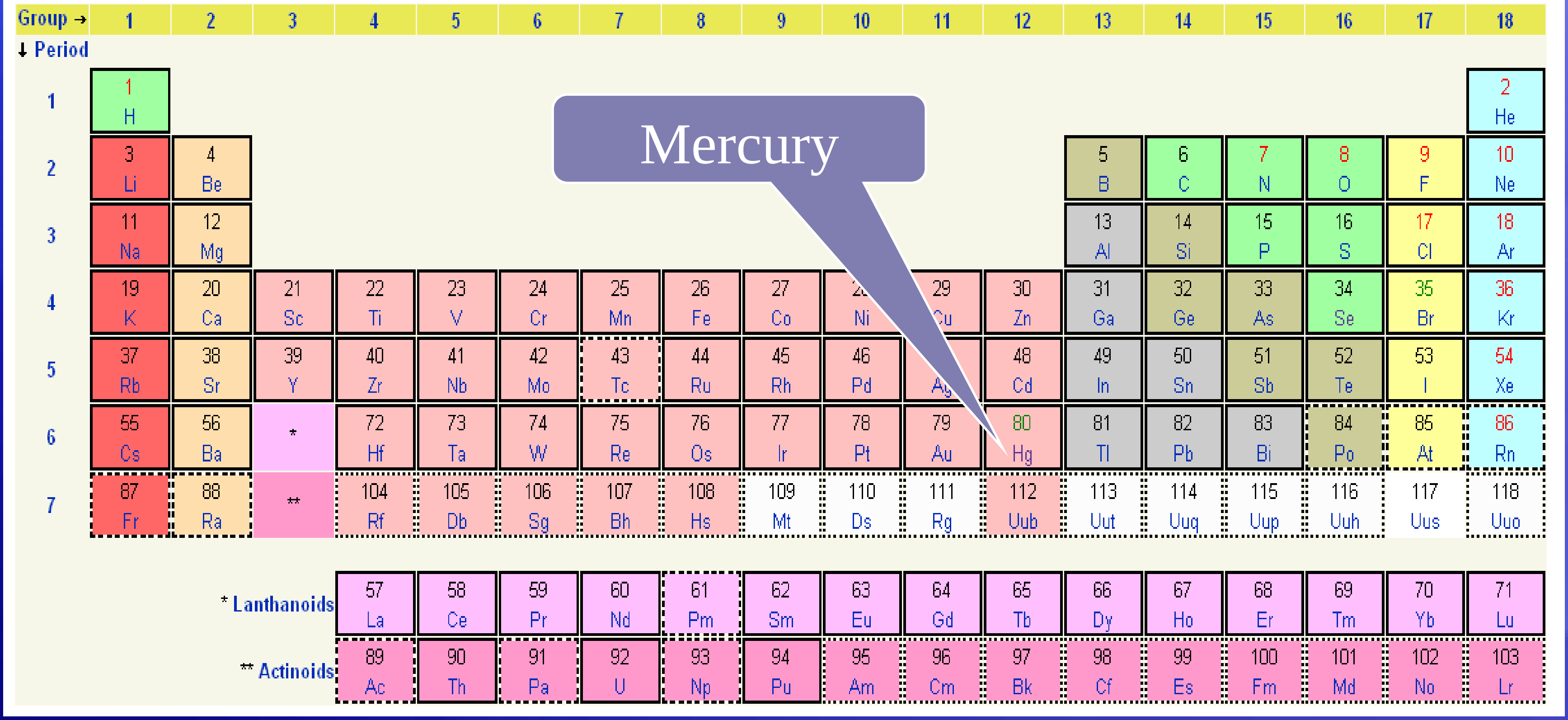
Selenium.

- Selenium is used for treating Mercury Poisoning

Discover the automating power of Selenium

Story about Selenium

- Mercury Quality Center (MQC) is developed by Mercury Interactive Corporation (Now HP owns it)



Group → ↓ Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	**	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Uub	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo
			* Lanthanoids	57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
			** Actinoids	89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

Mercury

- Professionals used MQC, QTP, WinRunner, LoadRunner and TestDirector
- Selenium users usually known at least any one of the Mercury Products

Selenium Components

- Selenium IDE
- Selenium RC
- Selenium Grid
- Selenium2 aka Webdriver

Supported Browsers

* Tests developed on Firefox via Selenium-IDE can be executed on any other supported browser via a simple Selenium-RC command line.

Browser	Selenium-IDE	Selenium-RC	Operating Systems
Firefox 3	1.0 Beta-1 & 1.0 Beta-2: Record and playback tests	Start browser, run tests	Windows, Linux, Mac
Firefox 2	1.0 Beta-1: Record and playback tests	Start browser, run tests	Windows, Linux, Mac
IE 8		Under development	Windows
IE 7	Test execution only via Selenium-RC	Start browser, run tests	Windows
Safari 3	Test execution only via Selenium-RC	Start browser, run tests	Mac
Safari 2	Test execution only via Selenium-RC	Start browser, run tests	Mac
Opera 9	Test execution only via Selenium-RC	Start browser, run tests	Windows, Linux, Mac
Opera 8	Test execution only via Selenium-RC	Start browser, run tests	Windows, Linux, Mac
Google Chrome	Test execution only via Selenium-RC(Windows)	Start browser, run tests	Windows
Others	Test execution only via Selenium-RC	Partial support possible	As applicable

Selenium IDE

- Selenium IDE (SIDE) is a complete Integrated Development Environment (IDE) for building Selenium test case.
- Firefox add-on that makes it easy to record, edit, and debug tests.
- Provides an easy-to-use interface for developing and running individual test cases or entire test suites.
- Can be used to generate code to run the tests with Selenium Remote Control (RC).

Selenium IDE Features

- Record, playback, edit
- Intelligent component identification will use object IDs, names, or XPath as needed
- Auto complete for all common Selenium commands
- Walk through test cases and test suites.
- Debug and set breakpoints
- Save tests as HTML, or export as other supported programming languages
- Support for Selenium user extensions

Selenium Commands – Selenese

1) Actions are commands that generally manipulate the state of the application. They do things like “click this link” and “select that option”.

- Can be called with “AndWait” suffix, e.g. “clickAndWait”.

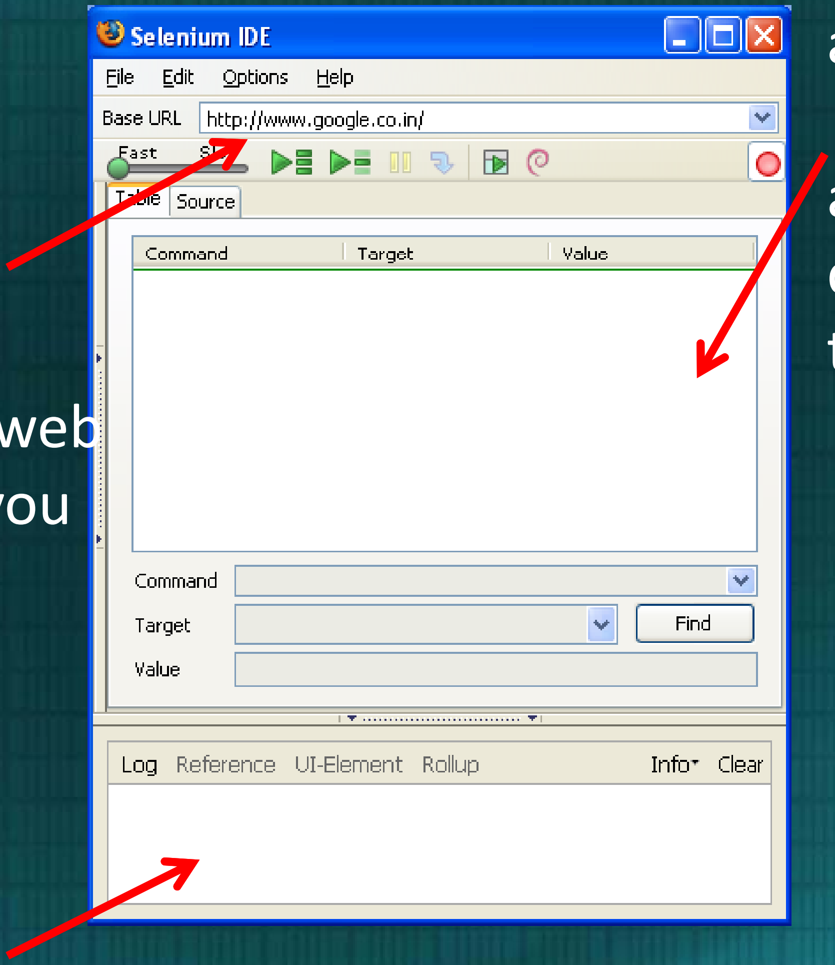
2) Accessors examine the state of the application and store the results in variables, e.g. “storeTitle”.

- They are also used to automatically generate Assertions.

3) Assertions are like Accessors, but verify that the state of the application conforms to what is expected. Eg. “make sure the page title is X”, “verify that this checkbox is checked”.

- All Selenium Assertions can be used in 3 modes: “assert”, “verify”, and ” waitFor”. For example, you can “assertText”, “verifyText” and “waitForText”.

Selenium IDE



Base URL: http://www.google.co.in/

The list of actions in

the

actual test case

to execute

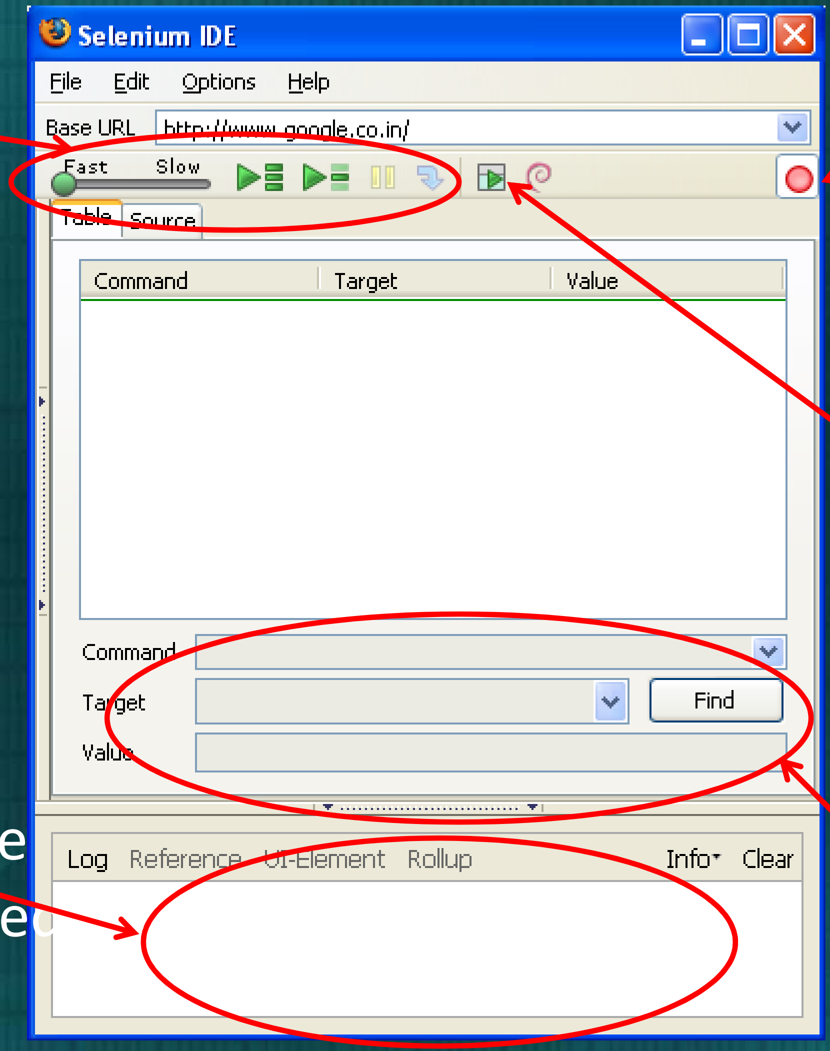
The root of web application you want to test

The log of the

Selenium IDE

Execution Commands

Reference of the currently selecte command



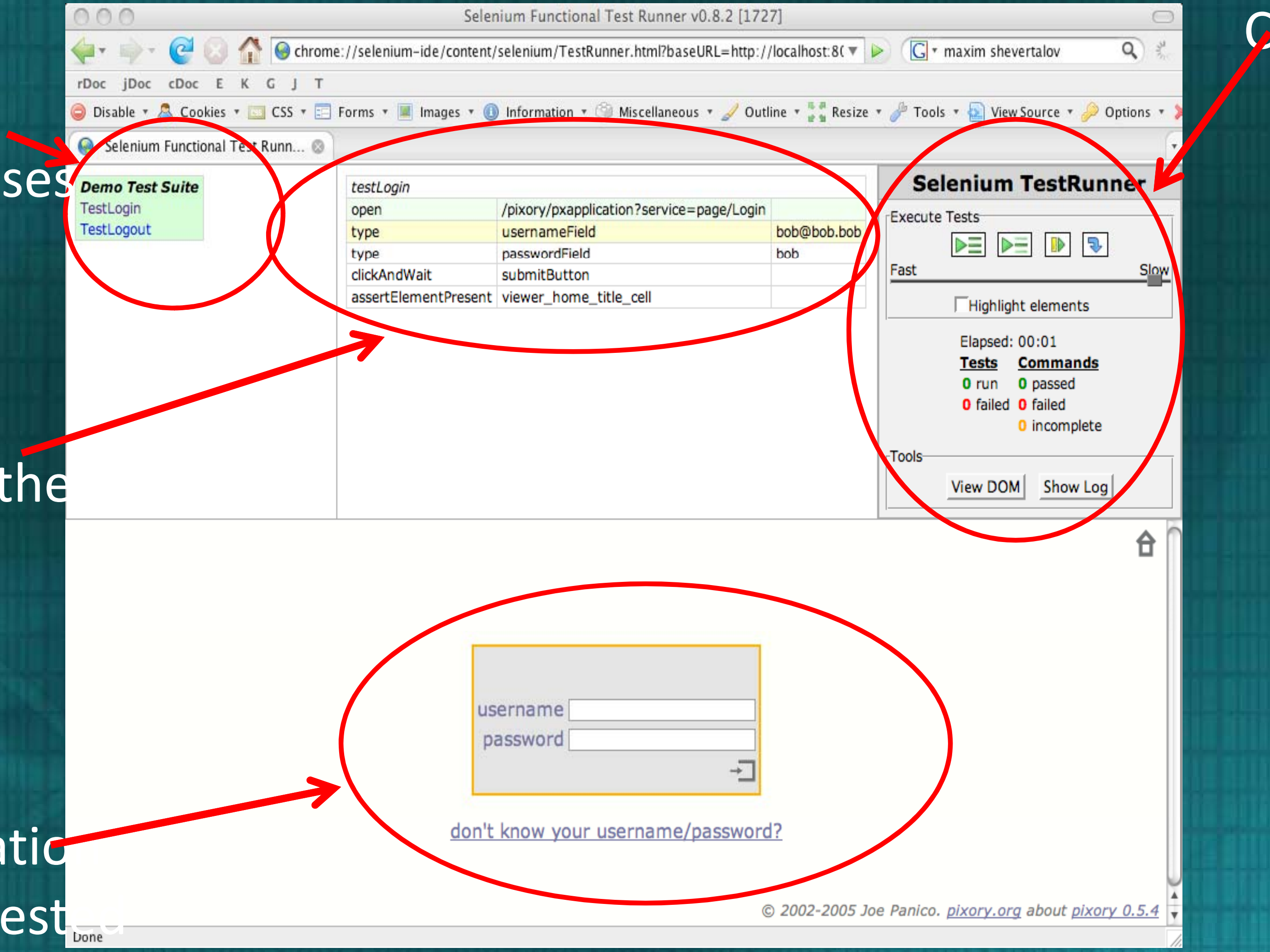
Base URL: http://www.google.co.in/

Record test actions

Try the test in the Web based TestRunner

Specify commands, including asserts

Test Suite



Selenium Functional Test Runner v0.8.2 [1727]
chrome://selenium-ide/content/selenium/TestRunner.html?baseURL=http://localhost:8(
maxim shevertalov
rDoc jDoc cDoc E K G J T
Disable Cookies CSS Forms Images Information Miscellaneous Outline Resize Tools View Source Options
Selenium Functional Test Runn...

Demo Test Suite
TestLogin
TestLogout

testLogin		
open	/pixory/pxapplication?service=page/Login	
type	usernameField	bob@bob.bob
type	passwordField	bob
clickAndWait	submitButton	
assertElementPresent	viewer_home_title_cell	

Selenium TestRunner

Execute Tests

Fast Slow

□ Highlight elements

Elapsed: 00:01

Tests	Commands
0 run	0 passed
0 failed	0 failed
	0 incomplete

Tools

username
password

don't know your username/password?

© 2002-2005 Joe Panico. pixory.org about pixory 0.5.4

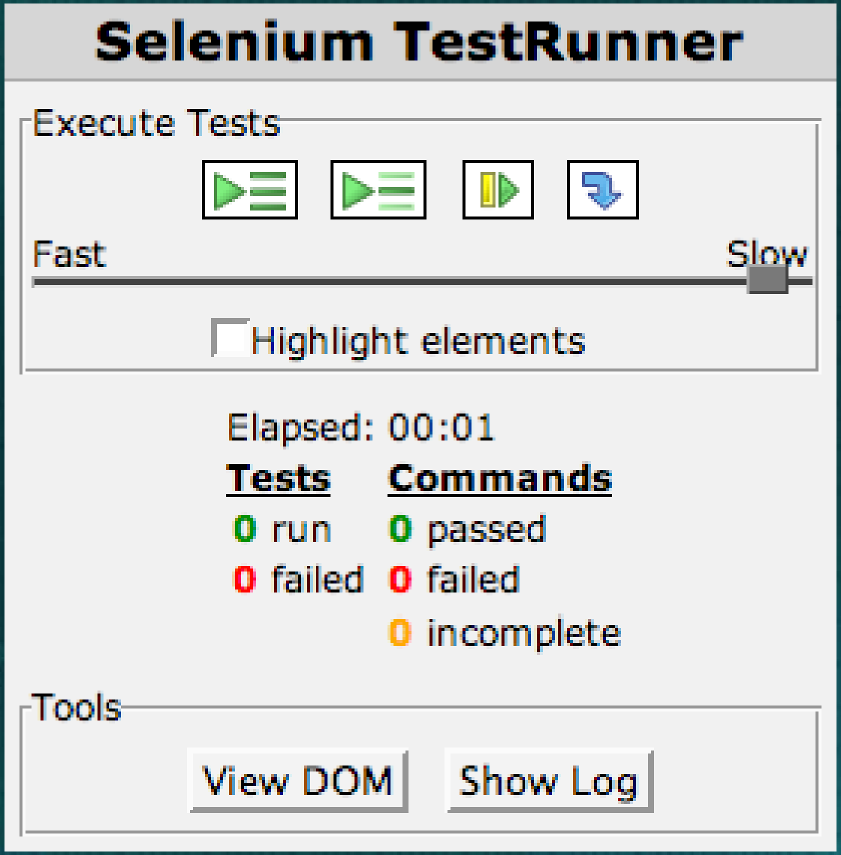
Test Cases

Steps of the test case

Applicatio being test

Execution Control

TestRunner Control



Elapsed: 00:01

Tests	Commands
0 run	0 passed
0 failed	0 failed
	0 incomplete

TestRunner Control

Run Selected Test

Pause/Pla
y
Execution

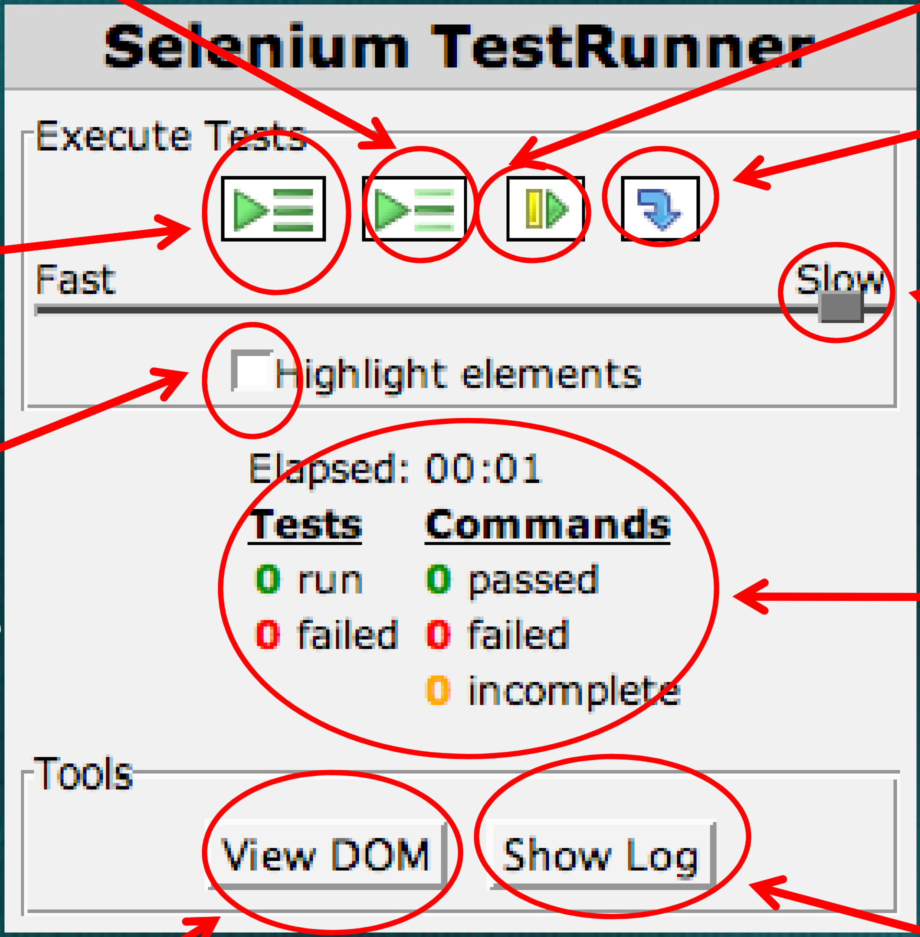
Step through
Execution

Run All Tests

Control Speed
of Execution

Highlight
Elements in the
Execution

Summary of
the Test



Selenium TestRunner

☐ Highlight elements

Elapsed: 00:01

Tests	Commands
0 run	0 passed
0 failed	0 failed
	0 incomplete

View the DOM
of the current
Page being tested

View the log of
the current
execution

Selenium-RC (Remote Control)

- Selenium-RC provides an API (Application Programming Interface) and library for each of its supported languages: HTML, Java, C#, Perl, PHP, Python, and Ruby.

- This ability to use Selenium-RC with a high-level programming language to develop test cases also allows the automated testing to be integrated with a project’s automated build environment.

Selenium-Grid

Selenium-Grid allows the Selenium-RC solution to scale for test suites or test suites to be run in multiple environments.

- With Selenium-Grid multiple instances of Selenium-RC are running on various operating system and browser configurations, each of these when launching register with a hub. When tests are sent to the hub they are then redirected to an available Selenium-RC, which will launch the browser and run the test.

- This allows for running tests in parallel, with the entire test suite theoretically taking only as long to run as the longest individual test.

Installing Selenium IDE

Installing Selenium IDE

Two step process:

- Step 1. Check if Firefox is installed

  1a. If Firefox is not installed on your machine then Install Firefox

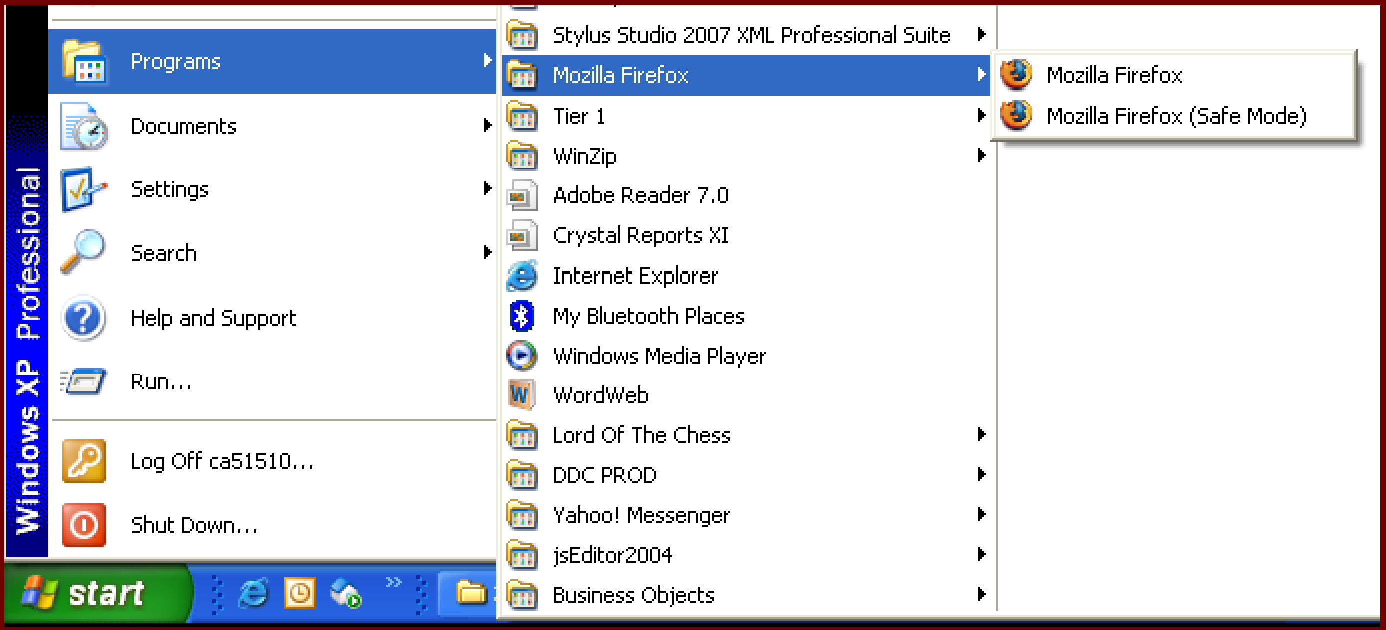
  (There is NO IE Version of Selenium)

- Step 2. Check if Selenium IDE is installed)

  2a. If Selenium IDE is not installed on your machine then Install Selenium IDE Plug In

Step 1: Is Firefox Installed?

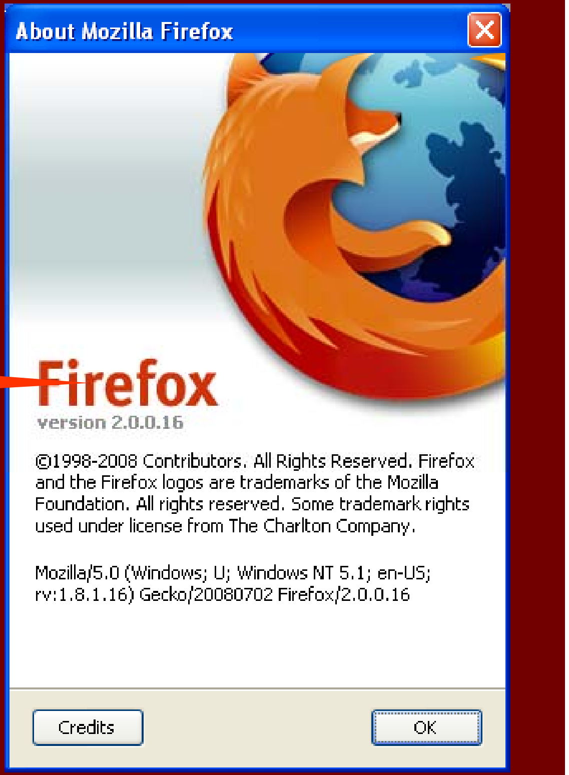
- Check whether your machine already has a version of Firefox installed.
- Go to Start → Programs → Mozilla Firefox



Step 1: Check Firefox Version

- Click on the Mozilla Firefox
- Go to Help → About as shown below:
- Check the version name
- What is your version?

Must be Firefox version 3.x.x.xx not 4.x.x.xx



version 2.0.0.16

©1998-2008 Contributors. All Rights Reserved. Firefox and the Firefox logos are trademarks of the Mozilla Foundation. All rights reserved. Some trademark rights used under license from The Charlton Company.

Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.8.1.16) Gecko/20080702 Firefox/2.0.0.16

Step 1a: Firefox Installation

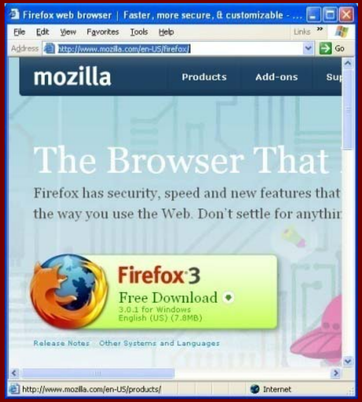
- Open your IE browser (or any other browser)
- Navigate to Firefox 3.6 download link.

http://www.oldapps.com/firefox.php?old_firefox=109?download

WARNING!!!!!

- Mozilla website will not have

Firefox 3.6 download link.


Firefox web browser | Faster, more secure, & customizable - ...
File
Edit
View
Favorites
Tools
Help
Links
Address
http://www.mozilla.com/en-US/firefox/
Go
mozilla
Products
Add-ons
Su

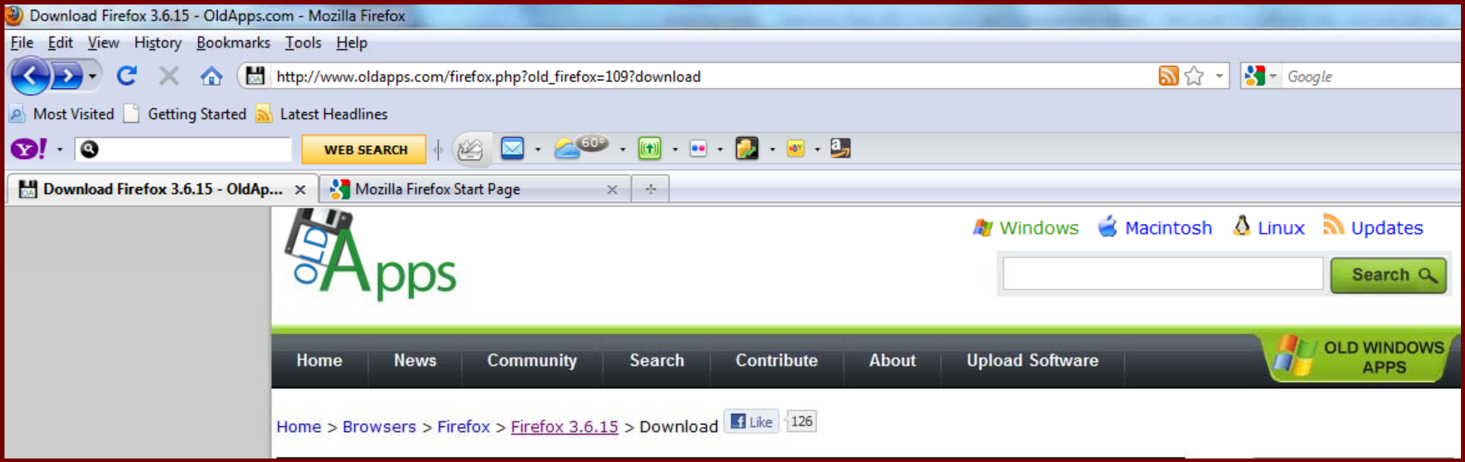
The Browser That

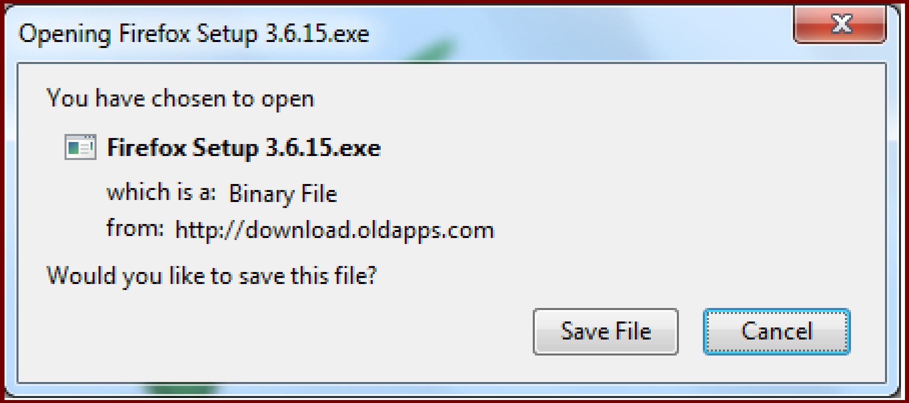
Firefox has security, speed and new features that the way you use the Web. Don't settle for anythi

Firefox 3
Free Download
3.0.1 for Windows
English (US) (7.8MB)
Release Notes
Other Systems and Languages
http://www.mozilla.com/en-US/products/
Internet

The most current browser version will be presented. (FF 4.0)

Step 1a: Firefox Installation


Download Firefox 3.6.15 - OldApps.com - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://www.oldapps.com/firefox.php?old_firefox=109?download
Google
Most Visited
Getting Started
Latest Headlines
WEB SEARCH
Download Firefox 3.6.15 - OldAp...
Mozilla Firefox Start Page
OLD Apps
Windows
Macintosh
Linux
Updates
Search
Home
News
Community
Search
Contribute
About
Upload Software
OLD WINDOWS APPS
Home > Browsers > Firefox > Firefox 3.6.15 > Download
Like
126


Opening Firefox Setup 3.6.15.exe

You have chosen to open

Firefox Setup 3.6.15.exe

which is a: Binary File

from: http://download.oldapps.com

Would you like to save this file?

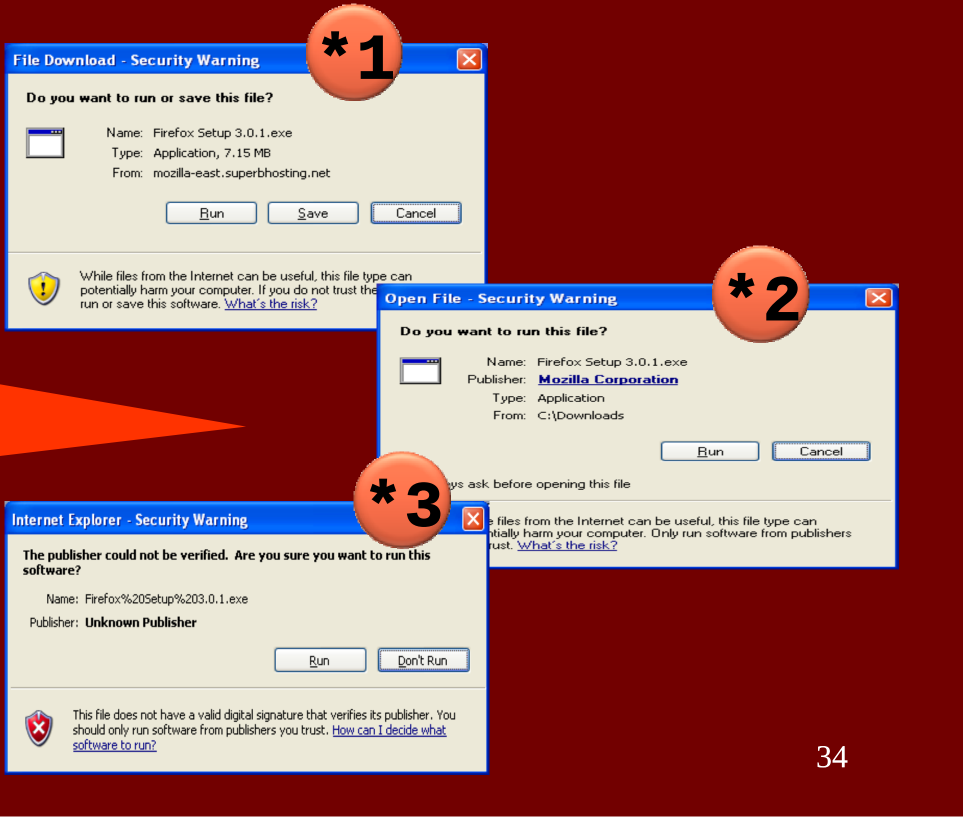
Step 1a: Firefox Installation

- Follow the steps and run the program (*1)

(Saving into local machine then running is recommended)

- If prompted with Security warning, press "Run" button (*2 & *3)

Save into your local machine.
 (C:\Downloads)
Run (double click Firefox Setup 3.x.x) from the location where you downloaded
Ignore Security warning and press "Run" button


*1
File Download - Security Warning
Run
Save
Cancel
*2
Open File - Security Warning
Run
Cancel
*3
Internet Explorer - Security Warning
Run
Don't Run

Do you want to run or save this file?

Name: Firefox Setup 3.0.1.exe
Type: Application, 7.15 MB
From: mozilla-east.superbhosting.net

While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the
run or save this software. What's the risk?

Do you want to run this file?

Name: Firefox Setup 3.0.1.exe
Publisher: Mozilla Corporation
Type: Application
From: C:\Downloads

ys ask before opening this file

e files from the Internet can be useful, this file type can
ntially harm your computer. Only run software from publishers
rust. What's the risk?

The publisher could not be verified. Are you sure you want to run this software?

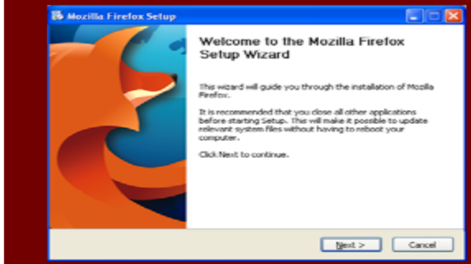
Name: Firefox%20Setup%203.0.1.exe
Publisher: Unknown Publisher

This file does not have a valid digital signature that verifies its publisher. You should only run software from publishers you trust. How can I decide what software to run?

Step 1a: Firefox Installation

- Press Next (*1)
- Check the “I Accept” then Press Next (*2)
- Select Standard, Remove check from “Use Firefox as my default browser” (*3)
- Press Install button (*4)
- Press Finish button (*5)

*1



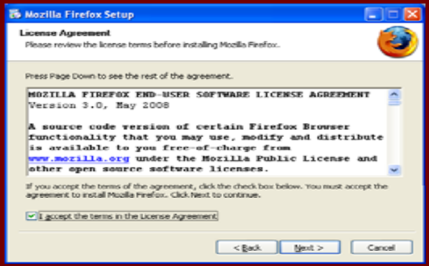
Welcome to the Mozilla Firefox Setup Wizard

This wizard will guide you through the installation of Mozilla Firefox.

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.

*2



License Agreement

Please review the license terms before installing Mozilla Firefox.

Press Page Down to see the rest of the agreement.

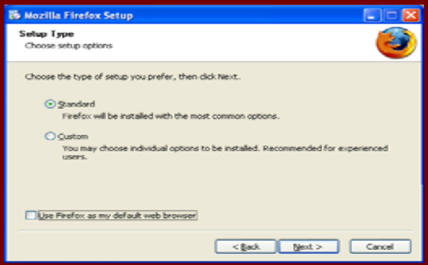
```
MOZILLA FIREFOX END-USER SOFTWARE LICENSE AGREEMENT
Version 3.0, May 2008

A source code version of certain Firefox Browser
functionality that you may use, modify and distribute
is available to you free-of-charge from
www.mozilla.org under the Mozilla Public License and
other open source software licenses.
```

If you accept the terms of the agreement, click the check box below. You must accept the agreement to install Mozilla Firefox. Click Next to continue.

☑ I accept the terms in the License Agreement

*3



Setup Type

Choose setup options

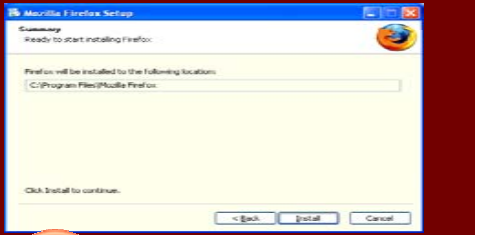
Choose the type of setup you prefer, then click Next.

● Standard
Firefox will be installed with the most common options.

○ Custom
You may choose individual options to be installed. Recommended for experienced users.

□ Use Firefox as my default web browser

*4



Summary

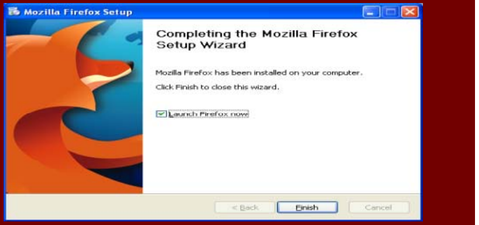
Ready to start installing Firefox

Firefox will be installed to the following location:

C:\Program Files\Mozilla Firefox

Click Install to continue.

*5



Completing the Mozilla Firefox Setup Wizard

Mozilla Firefox has been installed on your computer.

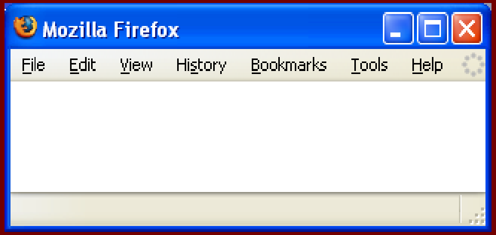
Click Finish to close this wizard.

☑ Launch Firefox now

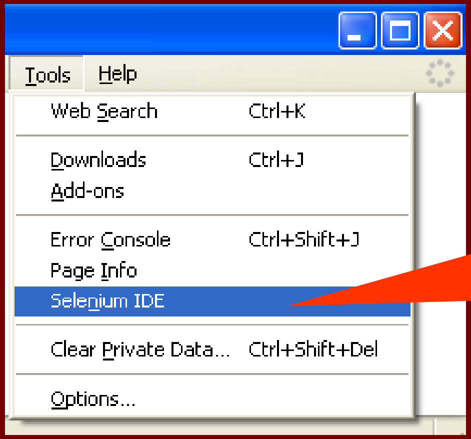
Step 2: Is Selenium IDE Installed?

- Open the Firefox browser window (*1)
- Go to Tools → Check whether Selenium IDE already exist there (*2)
- If you see “Selenium IDE” then you already having Selenium IDE plug-in installed in Firefox browser.
- If not installed then follow the instruction on the next slide

*1



*2



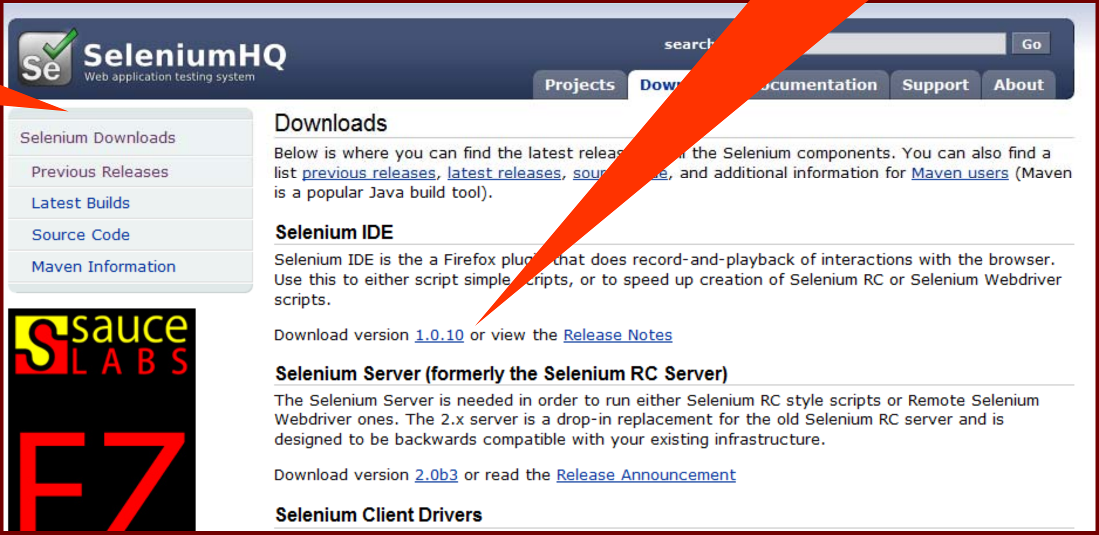
Check whether Selenium IDE is already installed

Step 2a: Installing Selenium IDE

- Open the Firefox browser window
- In the navigation tool bar type the below URL: http://seleniumhq.org/download/
- Click the Download link next to Selenium IDE project name.

Click Download

Don’t do this in IE



Downloads

Below is where you can find the latest releas the Selenium components. You can also find a list previous releases, latest releases, sour e, and additional information for Maven users (Maven is a popular Java build tool).

Selenium IDE

Selenium IDE is the a Firefox plug that does record-and-playback of interactions with the browser. Use this to either script simple cripts, or to speed up creation of Selenium RC or Selenium Webdriver scripts.

Download version 1.0.10 or view the Release Notes

Selenium Server (formerly the Selenium RC Server)

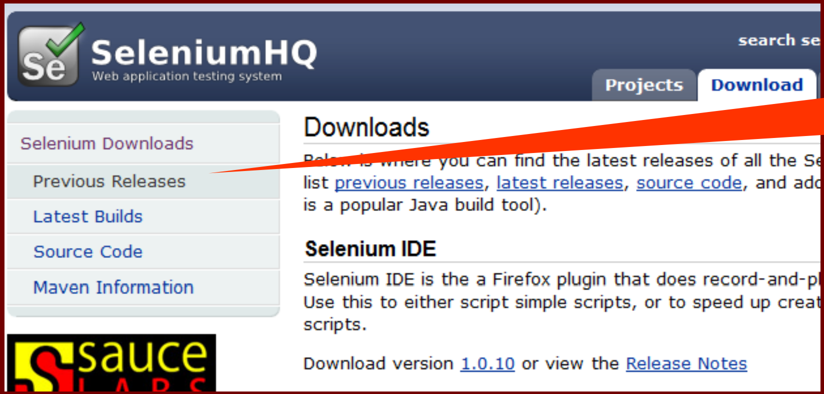
The Selenium Server is needed in order to run either Selenium RC style scripts or Remote Selenium Webdriver ones. The 2.x server is a drop-in replacement for the old Selenium RC server and is designed to be backwards compatible with your existing infrastructure.

Download version 2.0b3 or read the Release Announcement

Selenium Client Drivers

Step 2a: Installing Selenium IDE

Or you can find Selenium IDE downloads in Previous Releases directory:



Downloads

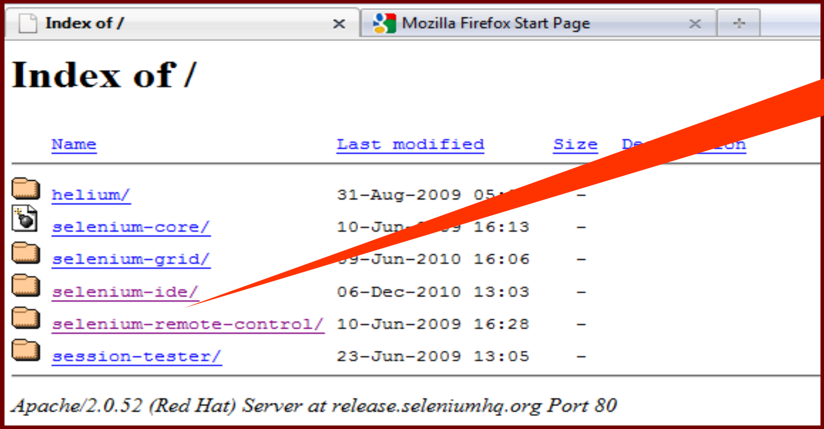
Below is where you can find the latest releases of all the Se list previous releases, latest releases, source code, and add is a popular Java build tool).

Selenium IDE

Selenium IDE is the a Firefox plugin that does record-and-pl Use this to either script simple scripts, or to speed up creat scripts.

Download version 1.0.10 or view the Release Notes

1. Previous Releases

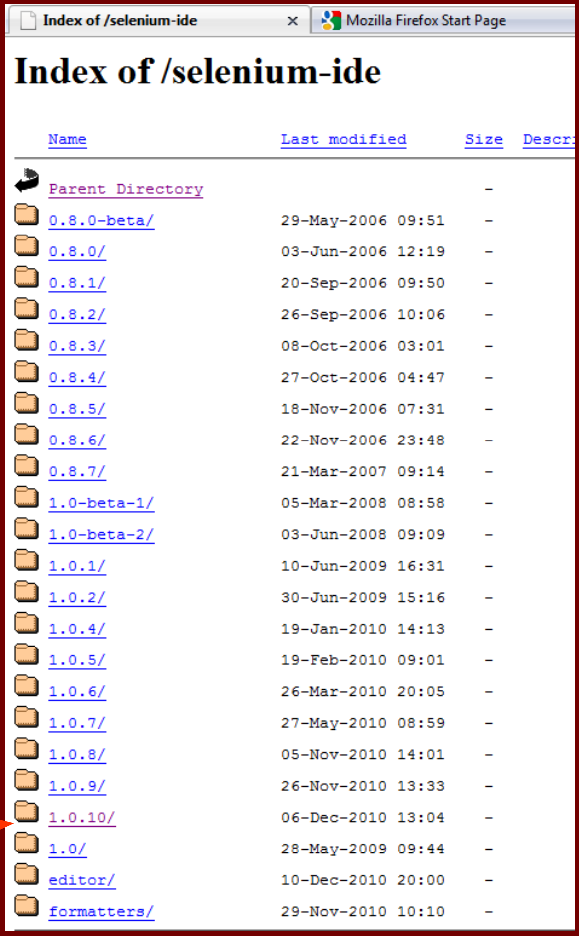


Index of /

Name	Last modified	Size	Description
helium/	31-Aug-2009 05:[illegible]	-	
selenium-core/	10-Jun-2009 16:13	-	
selenium-grid/	09-Jun-2010 16:06	-	
selenium-ide/	06-Dec-2010 13:03	-	
selenium-remote-control/	10-Jun-2009 16:28	-	
session-tester/	23-Jun-2009 13:05	-	

Apache/2.0.52 (Red Hat) Server at release.seleniumhq.org Port 80

2. Selenium IDE



Index of /selenium-ide

Name	Last modified	Size	Descr
Parent Directory		-	
0.8.0-beta/	29-May-2006 09:51	-	
0.8.0/	03-Jun-2006 12:19	-	
0.8.1/	20-Sep-2006 09:50	-	
0.8.2/	26-Sep-2006 10:06	-	
0.8.3/	08-Oct-2006 03:01	-	
0.8.4/	27-Oct-2006 04:47	-	
0.8.5/	18-Nov-2006 07:31	-	
0.8.6/	22-Nov-2006 23:48	-	
0.8.7/	21-Mar-2007 09:14	-	
1.0-beta-1/	05-Mar-2008 08:58	-	
1.0-beta-2/	03-Jun-2008 09:09	-	
1.0.1/	10-Jun-2009 16:31	-	
1.0.2/	30-Jun-2009 15:16	-	
1.0.4/	19-Jan-2010 14:13	-	
1.0.5/	19-Feb-2010 09:01	-	
1.0.6/	26-Mar-2010 20:05	-	
1.0.7/	27-May-2010 08:59	-	
1.0.8/	05-Nov-2010 14:01	-	
1.0.9/	26-Nov-2010 13:33	-	
1.0.10/	06-Dec-2010 13:04	-	
1.0/	28-May-2009 09:44	-	
editor/	10-Dec-2010 20:00	-	
formatters/	29-Nov-2010 10:10	-	

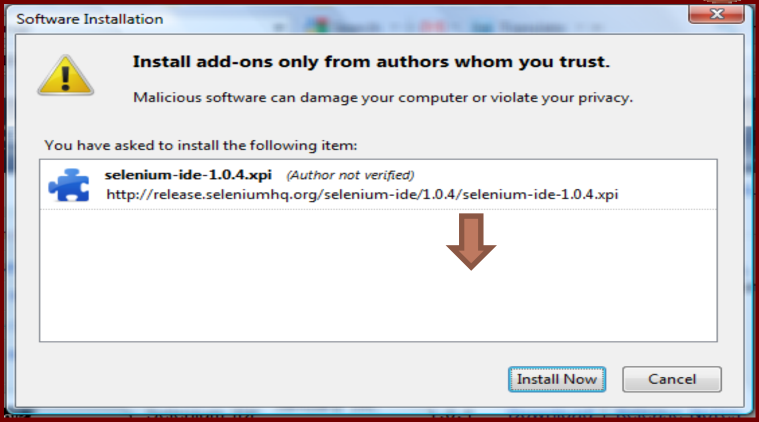
3. Version 1.0.10

Step 2a: Installing Selenium IDE

- When the Software Installation Window opens select “selenium-ide” (*1)
- Click Install Now button
- “Selenium IDE” add-on is installed (*2)
- Click on “Restart Firefox” button

Restart Firefox for Selenium Plug-in to take effect

*1



Software Installation

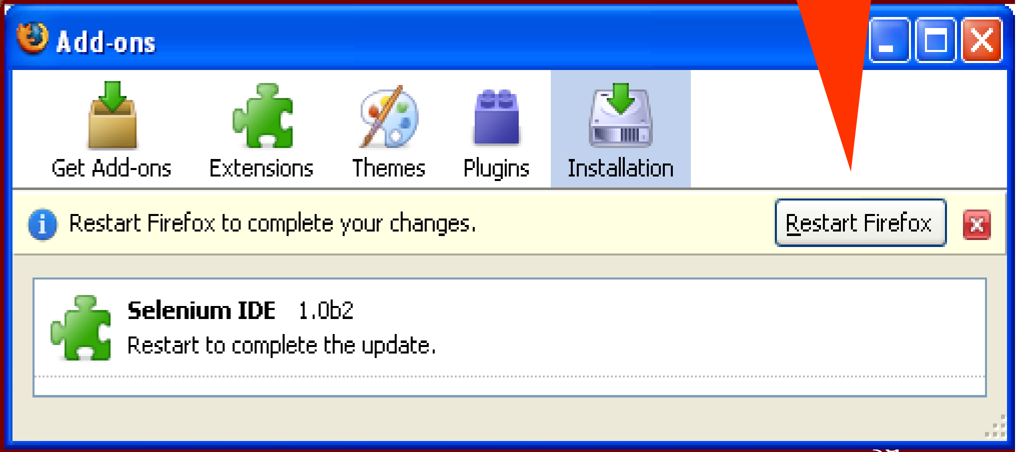
Install add-ons only from authors whom you trust.

Malicious software can damage your computer or violate your privacy.

You have asked to install the following item:

selenium-ide-1.0.4.xpi *(Author not verified)*
http://release.seleniumhq.org/selenium-ide/1.0.4/selenium-ide-1.0.4.xpi

*2



Restart Firefox to complete your changes.

Selenium IDE 1.0b2
Restart to complete the update.

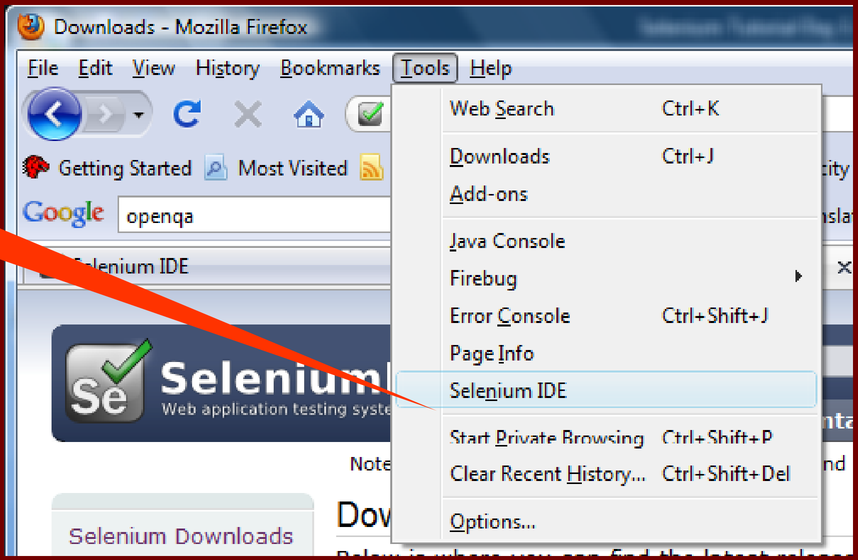
Step 2a: Installing Selenium IDE

In the Firefox browser go to Tools and verify whether "Selenium IDE" is displayed.

Congratulation!

Selenium IDE installation is completed.

Selenium IDE is successfully installed


Downloads - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Getting Started Most Visited
Google openqa
Selenium IDE
Selenium
Web application testing syste
Note
Selenium Downloads
Dov
Web Search Ctrl+K
Downloads Ctrl+J
Add-ons
Java Console
Firebug
Error Console Ctrl+Shift+J
Page Info
Selenium IDE
Start Private Browsing Ctrl+Shift+P
Clear Recent History... Ctrl+Shift+Del
Options...

Recording and Running Selenium Tests

Running Options

Run a Test Case

Click the Run button to run the currently displayed test case.

Run a Test Suite

Click the Run All button to run all the test cases in the currently loaded test suite.

Stop and Start

The Pause button can be used to stop the test case while it is running. The icon of this button then changes to indicate the Resume button. To continue click Resume.

Stop in the Middle

You can set a breakpoint in the test case to cause it to stop on a particular command. This is useful for debugging your test case. To set a breakpoint, select a command, right-click, and from the context menu select Toggle Breakpoint.

Running Options

Start from the Middle

You can tell the IDE to begin running from a specific command in the middle of the test case. This also is used for debugging. To set a start point, select a command, right-click, and from the context menu select Set/Clear Start Point.

Run Any Single Command

Double-click any single command to run it by itself. This is useful when writing a single command. It lets you immediately test a command you are constructing, when you are not sure if it is correct. You can double-click it to see if it runs correctly. This is also available from the context menu.

OpenClinica Issue Tracker (Mantis)

Ways to Use Mantis (1)

- First point of communication between clients and client services
- Tracking and reporting bugs found in versions of OpenClinica
- Tracking and reporting of bugs found in development/QA of OpenClinica
- Requesting new features for OpenClinica
- Recording requirements to be supported by OpenClinica

Ways to Use Mantis (2)
Client communication

- Clients ask general support questions
- Clients ask questions about the product
- Clients report issues they are seeing
- Clients provide new feature requests
- CS communicates Advisories
- CS communicates about deployments
- Am I missing anything?

Ways We Use Mantis (3)

Bugs in released software

- Reports come from external community members – OpenClinica Public Support
- Reports come from internal members of OpenClinica – Post-Release Projects
- Reports come from non-named end users – Post Release Projects

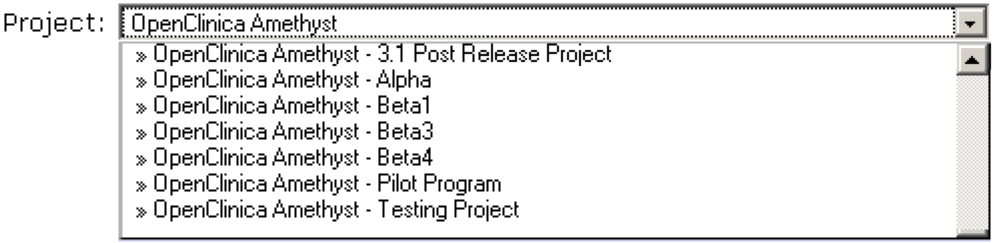
WAYS WE USE MANTIS (4)

DEVELOPMENT MILESTONES

- As QA and internal members test the work issues are reported
- As external members participate in testing, they report issues
- New features and functionality to be worked on for the next major milestone
- Requirements to be supported in a version of OpenClinica recorded in the Software Requirements project

Structure of Development Projects

- Main project is for the milestone
  - Ex. OpenClinica Amethyst
- Sub-projects for the following:
  - Alphas
  - Betas
  - Pilot Programs
  - Testing
  - Post Release



Project: OpenClinica Amethyst

» OpenClinica Amethyst - 3.1 Post Release Project
» OpenClinica Amethyst - Alpha
» OpenClinica Amethyst - Beta1
» OpenClinica Amethyst - Beta3
» OpenClinica Amethyst - Beta4
» OpenClinica Amethyst - Pilot Program
» OpenClinica Amethyst - Testing Project

Reporting an Issue (1)

- Following fields can be provided when reporting an issue:
  - Category*
    - Choose the module or other location the issue appears in
  - Reproducibility
    - Choose the option that describes your best attempts at reproducing the issue
  - Severity
    - Choose the level of pain that is felt with this issue.
      - What each level means will be detailed in a subsequent slide
  - Priority
    - Choose the level of importance to fixing this issue
      - What each level means will be detailed in a subsequent slide
  - Product Version
    - The version of the product the issue manifests itself
      - Only relevant to bugs found in released versions of the software
  - Target Version
    - The version of the product will be targeted for inclusion
      - To be determined by QA/DEV and Bug Review Committee

Reporting an Issue (2)

- Following fields can be provided when reporting an issue:
  - Summary*
    - Provide a brief and meaningful summary of the issue encountered
      - Someone should be able to look at the summary and immediately know what the problem is
  - Description*
    - Provide a more in depth and detailed set of information to explain the issue in a full and complete manner
  - Steps to Reproduce
    - Based on your reproductions of the issue, detail each of the steps and scenarios that allow the issue to manifest itself in the software
  - Additional Information
    - Provide any additional data or description that will help the diagnosis of the issue
  - Upload File
    - Place to upload screenshots, CRFs, Rules, and any other files that will assist QA/Development to recreate the problem and help troubleshooting
      - If the file is to large, add it to the S:\ drive and provide the link to it in the Additional Information section

Meaning of 'Status'

In Development Projects

- Status of Mantis Issues
  - New
    - Newly created issue with no assignment to anyone
  - Assigned
    - The issue has been assigned to a developer to work on or to a QA to diagnose further
  - Feedback
    - The issue is assigned back to the original reporter or someone else to get further information or clarification on the issue/feature
  - Resolved
    - Will be explained further in the meaning of 'Resolution' on the next slide
  - Closed
    - When an new version of OpenClinica is released containing the fix or work for a particular issue, it is set to Closed
  - Acknowledged (used sparingly)
    - The issue is acknowledged to be a problem, a solution is known and can be provided, but is not going to be actively worked on for a particular release
  - Confirmed (not used
    - For Enterprise Client projects, this is used to confirm what the client reported is in fact an issue in the software

Meaning of 'Resolution'

In Development Projects

- When an issue is set to a Resolved status, there are 9 possibilities
  - Fixed
    - The issue or feature has been fixed in the developer's eyes
  - Unable to Reproduce
    - Issue or problem is not reproducible and will no longer be looked at
  - Duplicate
    - The same issue has been reported more than once. One or more of the other issues have been set to 'fixed'
  - No Change Required
    - Despite the report, the software is functioning as expected and nothing should be done
  - Suspended
    - Issue will not be completed for a particular release of OpenClinica but will be slotted for inclusion in a future release
  - Won't Fix
    - Issue will not be fixed for any release of OpenClinica
  - Re-opened
    - If an issue had been set to fixed but further testing proved the problems persist, it will be re-opened and the 'Status' will be Assigned
  - Not Fixable (very rarely used)
    - The issue can not be fixed.
  - Open (not used)

Mantis Issue Lifecycles

- We will cover the following scenarios
  - 1) Issue logged in an Enterprise project and included in a release
  - 2) Issue logged in main Dev project and included in a milestone release
  - 3) Issue logged in main Dev project and not included in a milestone release
  - 4) Issue logged in Post Release project and included in a maintenance release
  - 5) Issue logged in Post Release project and not included in a maintenance release
  - 6) Issue logged in a Post Release project and included in a milestone release
  - 7) Issue logged in a Post Release project and not included in a milestone release

Lifecycle 1

Issue logged in an Enterprise project and included in a release

- Client A logs an issue in their Enterprise support project
- CSR attempts to recreate with the version used by Client A
- When the issue is recreated
  - CSR marks issue as Confirmed in the Enterprise project
  - CSR creates a New issue in the Post Release project called – Post-release
    - Provides as much information and supporting documents as possible with all references to the client stripped out
  - Issues are linked together by setting them as 'related' to one another.
- Issue is raised at a Bug Review meeting and next steps are identified
  - Further research needed
  - Further clarification needed
  - Issue will be targeted for a specific maintenance release (i.e. 3.1.2)
- A developer will work to fix the problem
- Developer fixes the issue and sets the issue to Resolved/Fixed
- QA tests the fix
  - Fix is verified, the Fixed in Version is updated
- Maintenance release is finalized and delivered as a production ready application
  - Issue in the Post Release project is set to Closed
  - Client issue is set to Resolved/Fixed when the maintenance release is installed for them

Lifecycle 2

Issue logged in main Dev project and included in a milestone release

- Issue/Feature is logged in a main development project
  - Target Version is the code name for the release (i.e. Amethyst)
- Developer works on the issue/feature
  - Adds notes while they work
- Developer fixes the issue and sets the issue to Resolved/Fixed
  - SVN commit number is provided
- QA tests the fix
  - Fix is verified, the Fixed in Version is updated
- Milestone Release is finalized and delivered as a production ready application
  - Issue in the project is set to Closed

Lifecycle 3

Issue logged in main Dev project and not included in a milestone release

- Issue/Feature is logged in a main development project
  - Target Version is the code name for the release (i.e. Amethyst)
- Developer works on the issue/feature
  - Adds notes while they work
- Internal discussion about whether the issue will be included in the milestone release
- QA sets the issue to Resolved/Suspended
  - New target version is XXX-Maintenance
- Milestone Release is finalized and delivered as a production ready application
  - Issue is moved to the Post Release project
  - Issue is updated back to a status of New and a resolution of Suspended

LIFECYCLE 4

ISSUE LOGGED IN POST RELEASE PROJECT AND INCLUDED IN A MAINTENANCE RELEASE

- Issue/Feature is logged in a Post Release project
- Issue is raised at a Bug Review meeting and next steps are identified
  - Further research needed
  - Further clarification needed
  - Issue will be targeted for a specific maintenance release (i.e. 3.1.2)
- Developer works on the issue/feature
  - Adds notes while they work
- Developer fixes the issue and sets the issue to Resolved/Fixed
  - SVN commit number is provided
- QA tests the fix
  - Fix is verified, the Fixed in Version is updated
- Maintenance Release is finalized and delivered as a production ready application
  - Issue in the project is set to Closed

LIFECYCLE 5

ISSUE LOGGED IN POST RELEASE PROJECT AND NOT INCLUDED IN A MAINTENANCE RELEASE

- Issue/Feature is logged in a Post Release project
- Issue is raised at a Bug Review meeting and next steps are identified
  - Further research needed
  - Further clarification needed
  - Issue will be targeted for a specific maintenance release (i.e. 3.1.2)
- Developer works on the issue/feature
  - Adds notes while they work
- Internal discussion about whether the issue will be included in the milestone release
- QA sets the issue to Resolved/Suspended
- Maintenance Release is finalized and delivered as a production ready application
  - If it is to be targeted for the next maintenance release:
    - The issue is updated back to a status of New and a resolution of Suspended. New target version is specified
  - If it is not to be targeted for the next maintenance release:
    - Issue is copied and then moved to the next Milestone project
  - Issue is updated back to a status of New and a resolution of Suspended in the Milestone project
  - Target Version is changed to the Version code name (i.e. Aquamarine)

Thanks!