CHEAP AND FREE TEST TOOLS

RANDALL W. RICE, CTAL

WWW.RICECONSULTING.COM

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AT THE START

- **This will be an interactive session**
  - Some demos and videos
- **Screenshots**
- **Helpful hints**
- **I get no compensation from tool vendors, but I do get review licenses for some of the tools.**
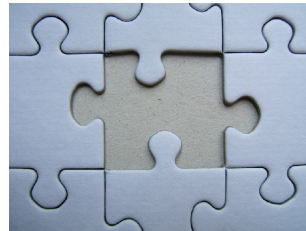
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2
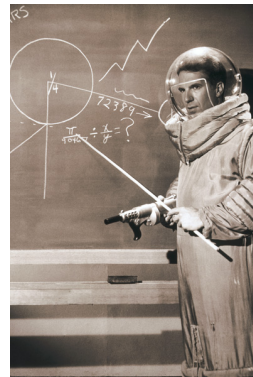
WE CAN'T COVER ALL TOOLS

- **I focus on tools you may not have heard about.**
- **I welcome hearing about free and inexpensive tools you have found helpful.**
  - At the end of each tool type, I'll ask for your suggestions about other tools.

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CONSTRAINTS

- **You may find it hard to get your management to consider using an open-source or free tool.**
- **Some companies are heavily invested in commercial tools (that may or may not be the best ones for you), so they keep out any other options.**

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COMMON ACCEPTANCE ISSUES

- **Security**
  - Code vulnerabilities
- **Vendor uncertainty**
  - Open source has none
  - Small vendors are often acquired
- **Support levels**
- **Future tool direction**
  - Free, paid, or no growth at all

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A STRATEGY FOR ACCEPTANCE

- **Make the business case in cost vs. benefits.**
  - Also, bring out the reality of having a free tool vs. no tool.
- **Include information about companies like Sun, IBM, and Microsoft that have contributed open-source and free software.**

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THINK ABOUT COMMERCIAL TOOLS

- **Security**
  - Do commercial tools have security issues?
- **Vendor certainty**
  - Are larger vendors acquired?
- **Direction of the tool**
  - Do major tools fade away?
- **Support levels**
  - Are major tools well-supported?

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WHAT'S THE ANSWER?

- **Keep an open mind.**
- **You can be successful with a wide variety of tools if you get a "best fit" for your needs.**
- **Price is not the best way to determine tool quality or applicability to your needs.**

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EVALUATIONS

- **Regardless of the tool cost or source, you should do a good evaluation and proof of concept.**
- **Even free tools require an investment of time to:**
  - Learn
  - Install
  - Maintain

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YOUR PERSONAL TOOLKIT

- **As a tester, it's good to have your own set of test tools.**
  - You don't get locked into one tool set.
  - You can learn on your own.
  - You can be a value-added resource in your company concerning test tools.
  - You can take your tools wherever you go!

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TOOL TYPES WE WILL COVER

- Test Design
- Test Execution
- Test Frameworks
- Performance Testing and Monitoring
- Test Management
- Test Data
- Test Evaluation
- Defect Tracking
- Special Applications – SOA, Load testing, Web testing

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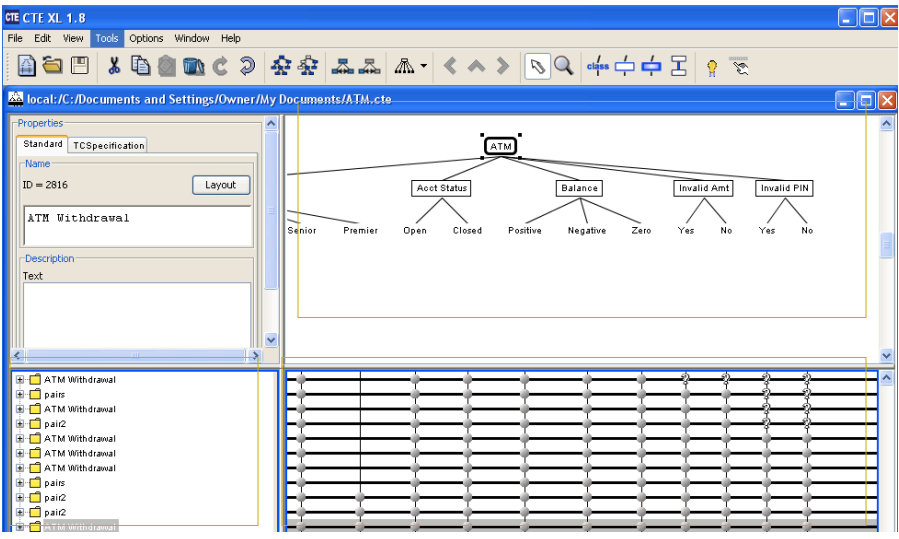
TEST DESIGN

- CTE-XL for classification trees
- ACTS - www.nist.gov
- AllPairs – www.satisfice.com
- PICT – www.microsoft.com
- More at www.pairwise.org

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Free and Cheap Test Tools

CTE-XL

- **www.berner-mattner.com**
- **Free version still available**
  - However, the test case generation function (the best part) has been moved to the "pro" version ~ $2,500/seat.
- **Pro version with extended functionality**
- **Based on the classification tree approach**
- **Generates test cases in a variety of ways.**

Free and Cheap Test Tools

FREE MIND

- **Mind mapping for test case design**
- **Windows, Linux and Mac versions**
- **Open source**
- **freemind.sourceforge.net**

FUNCTIONAL DECOMPOSITION WITH FREE MIND
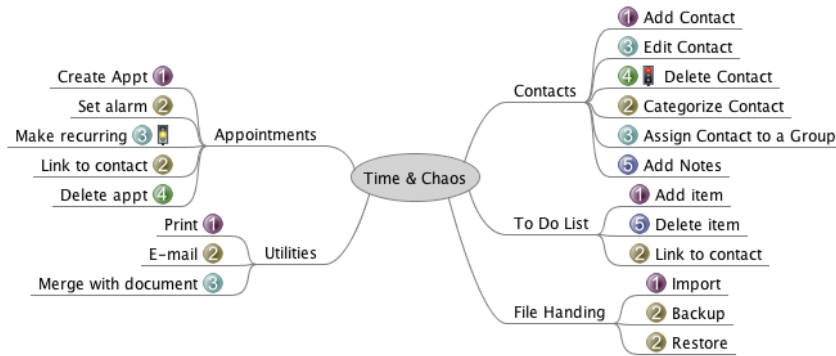
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XMIND

- **Xmind is an open source tool for mindmapping, brainstorming and much more.**
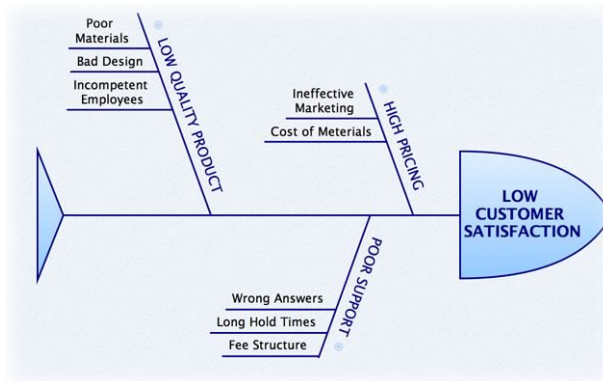- **Free and Pro versions**
- **Mac, Windows, Linux**
- **http://www.xmind.net/**

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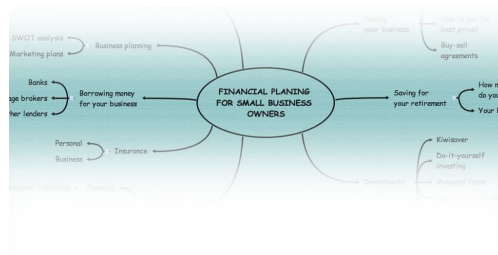
Free and Cheap Test Tools

XMIND (2)

Fishbone Diagram

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XMIND (3)

Gantt View

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XMIND (4)

Online Sharing

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MINIMAL ESSENTIAL TEST STRATEGY (METS)

- **Developed by Greg Paskal**
  - www.gregpaskal.com
- **A way to quickly define features and functions to be tested by levels of criticality.**
- **Test time can be estimated along with potential defect severity.**
- **Also available as an iPhone app.**

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PHYSICAL ITEMS

- **"Items" to be tested that can be "touched".**
  - Examples: Buttons, web pages, etc.
- **These enable functionality, but are not the functions.**
- **These have attributes at various levels of criticality:**
  - Example: Images
    - Critical: Image is present
    - High: Image is correct
    - Med: Image loads quickly (size)
    - Low: Image is clear

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METS — Physical Test Grid

| Category	Critical	High	Medium	Low
Pages	Page completes loading	Loading completes in a reasonable amount of time	Page loading consistent between browser versions	Page loading time reasonable under load
	Graphics, text and other elements seem to be in correct locations	Page has logical flow	Color contrast issues	
Graphics	Graphics loading completely	Graphics completed loading within same time frame	Consistently loading every time	
	Scaling, cropping or image quality problems	Highly artifact (distorted) image quality	Unpredictable color rendering at various bit depths	Non-browser safe color pallet used
	Rollover graphics displaying correctly	Graphic rollover state providing correct transition illusion	Preloaders working correctly for quick screen redraw	
	Graphical text within graphic is legible	Correctly spelled text within graphic		
Forms	Dropdown menus are functional	Dropdown menu contains all desired options	Submitted form contains dropdown menu selection(s)	
		Dropdown items are spelled correctly		
	Radio Buttons are functional	Radio button effect, turning off related radio buttons is working	Submitted form contains radio button selection	
		Radio buttons are spelled correctly		
	Checkboxes are functional	Selection of multiple checkboxes is possible	Submitted form contains checkbox selection(s)	
		Checkbox text is spelled correctly		
	Text fields and boxes are functional	Text field and boxes have correctly spelled default text	Text fields allow enough room for a typical data entry	
			Submitted form contains text field and text box information	

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PHYSICAL TEST METRICS

- **Shows for each item:**
  - Estimated time required for testing
  - Estimated impact severity

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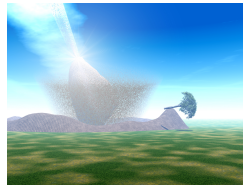
	A	B	C	D	E
1	**METS** Minimal Essential Testing Strategy	**Physical Test Metrics**			
3	**Test**	**Category**	**Importance**	**Time Required**	**Potential Severity**
4	Page completes loading	Pages	Critical	1	1
5	Graphics, text and other elements are in correct locations	Pages	Critical	2	4
6	Page loading completes in a reasonable time.	Pages	High	1	3
7	Page has intuitive and logical flow.	Pages	High	2	4
8	Page loading is consistent between browser versions	Pages	Medium	3	2
9	Page has color contrast problems.	Pages	Medium	1	4
10	Page loading time reasonable under load.	Pages	Low	60	2
11	Graphics loading completely	Graphics	Critical	1	3
12	Scaling, cropping or image quality problems	Graphics	Critical	1	3
13	Rollover graphics displaying correctly.	Graphics	Critical	2	3

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Free and Cheap Test Tools

FUNCTIONS

- **"Actions" to be tested.**
  - Examples: Create, cancel, query, etc.
- **These are things the application can "do."**
- **Example: Shopping cart functions**
  - Critical: Can an item be placed into the cart?
  - High: Can multiple items be put into shopping cart?
  - Medium: Do items consistently carry through purchase session?
  - Low: Are related products shown?

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METS — Functional Test Grid

Category	Critical	High	Medium	Low
Accounts	Creating an account possible	Can user change account details such as shipping address.	Can user delete an account?	
	Logging into an account possible.	Can user request forgotten login information?	Does account time out require re-login after specified inaction?	Is the user notified when why they must re-login?
Shopping Cart	Can an item be placed into the cart?	Can multiple items be put into shopping cart?	Do items consistently carry through purchase session?	Is tax being calculated correctly?
	Can an item be removed from the cart?	Does cart reflect removed item correctly	Are removed items affecting the subtotal, total or tax?	
		Can more than one item be removed at a time?		
Product Catalog	Can user get to online catalog?	Does online catalog reflect entire product line?	Can user sort catalog items buy price, size or color?	Does the catalog item reflect the product being sold?
Trans-actional	Can user place an order?	Can user back out of an order?	Does using the browser back button effect the order transaction?	Is the user notified when a transaction is complete?
		Can user save an order for later?	When user comes back to saved order is it accurate in items in cart and pricing?	
Search	Can user search from home page?	Do the search results link correctly to the found content?	Is the found content logical to the original search?	Were search results sorted according to the business rules?

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METRICS

- **Based on estimated test time and assessed potential impact severity.**
- **Items are assessed by:**
  - Direct testing
    - Test pertaining to the obvious change or fix.
  - Related testing
    - Test pertaining to areas that may be impacted by the changes made.
  - Regression testing
    - Test you would run on the application regardless of what has changed.

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METS FUNCTIONAL TEST METRICS

Test	Category	Importance	Time Required	Potential Severity	Direct Testing	Related Testing	Regression Testing	D	R	B
Creating an account possible	Accounts	Critical	5	1	x			5		
Logging into an account possible.	Accounts	Critical	1	1		x			1	
Can user change account details such as shipping address.	Accounts	High	5	3		x			5	
Can user request forgotten login information?	Accounts	High	5	3		x			5	
Can user delete an account?	Accounts	Medium	3	3			x			3
Does account time out require re-login after specified inaction?	Accounts	Medium	10	3		x			10	
Is the user notified when why they must re-login?	Accounts	Low	10	4		x			10	
Can an item be placed into the cart?	Shopping Cart	Critical	1	1			x			1
Can an item be removed from the cart?	Shopping Cart	Critical	2	2	x			2		
Can multiple items be put into shopping cart?	Shopping Cart	High	2	2						
Does cart reflect removed item correctly	Shopping Cart	High	3	2						
Can more than one item be removed at a time?	Shopping Cart	High	3	4						
Do items consistently carry through purchase session?	Shopping Cart	Medium	10	1						

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METS FUNCTIONAL TEST METRICS (2)

37	Does the download work correctly once on the customers computer?	File Down-loading	High	5	1								
38	Is the download easy to locate?	File Down-loading	Medium	2	4								
39	Are the file size(s) and operating system requirements correct?	File Down-loading	Low	5	4								
40	Can a customer upload a file?	File Up-loading	Critical	5	2								
41	Is the upload functionality providing an intact file on the business side once upload is complete?	File Up-loading	High	10	2								
42	Is the file correctly relatable back to the originating customer and/or order?	File Up-loading	Medium	10	2								
43	Are the upload instructions clear and understandable?	File Up-loading	Low	5	4								
44													
45								Totals					
46							Quantity				Time		
47						2	5	2		7	31	4	
48													
49													

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METS TIME BUDGETER

	B	C	D	E	F
	Time Budgeter				
	Time available for testing: 4.00				
6	**Description**	**Budgeted %**	**Time Budgeted**	**Time Utilized**	**Time Still Available**
7	**Direct Testing**	25%	1.00	0.07	0:53
8	**Related Testing**	50%	2.00	0.31	1:29
9	**Regression Testing**	25%	1.00	0.04	0:56
10	**Totals**	100%	4.00	0.42	

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METS IPHONE APP
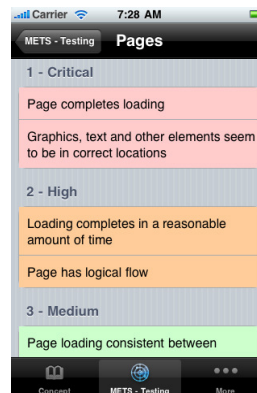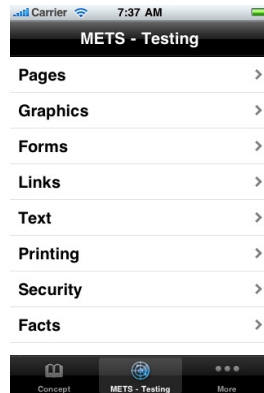
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DIA

- **Dia is roughly inspired by 'Visio,' though more geared towards informal diagrams for casual use.**
- **Open Source**
- **Has special objects to help draw entity relationship diagrams, UML diagrams, flowcharts, network diagrams, and many other diagrams.**
- **Can export diagrams to a number of formats, including EPS, SVG, XFIG, WMF and PNG, and can print diagrams (including ones that span multiple pages).**
- **http://live.gnome.org/Dia**

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Free and Cheap Test Tools
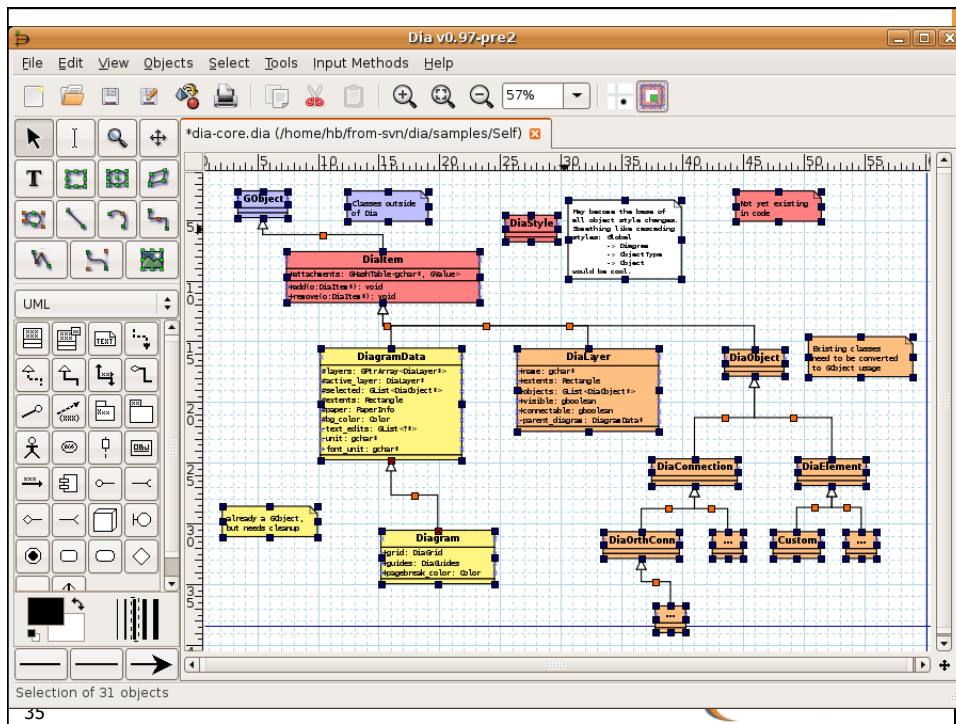
GLIFFY

- **Online diagramming application**
- **Free, standard and pro versions**
  - $4.95 / month for standard
  - $9.95 / month for pro
- **www.gliffy.com**

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BUSINESS PROCESS DIAGRAM CREATED IN GLIFFY

37
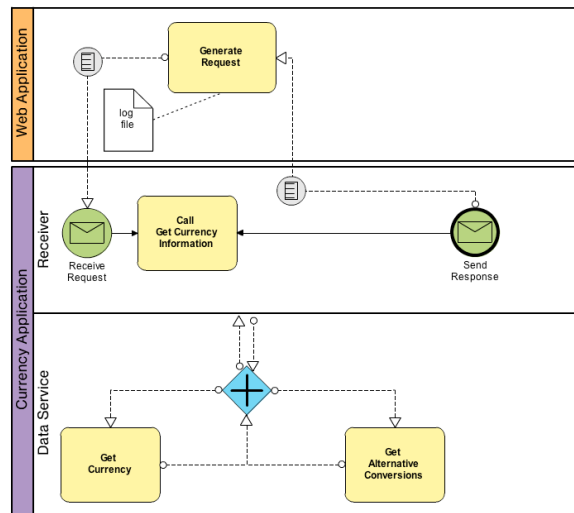
SHAPES

- **Diagramming tool for Mac OS X Snow Leopard**
- **4.99**
- **www.shapesapp.com**

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Free and Cheap Test Tools
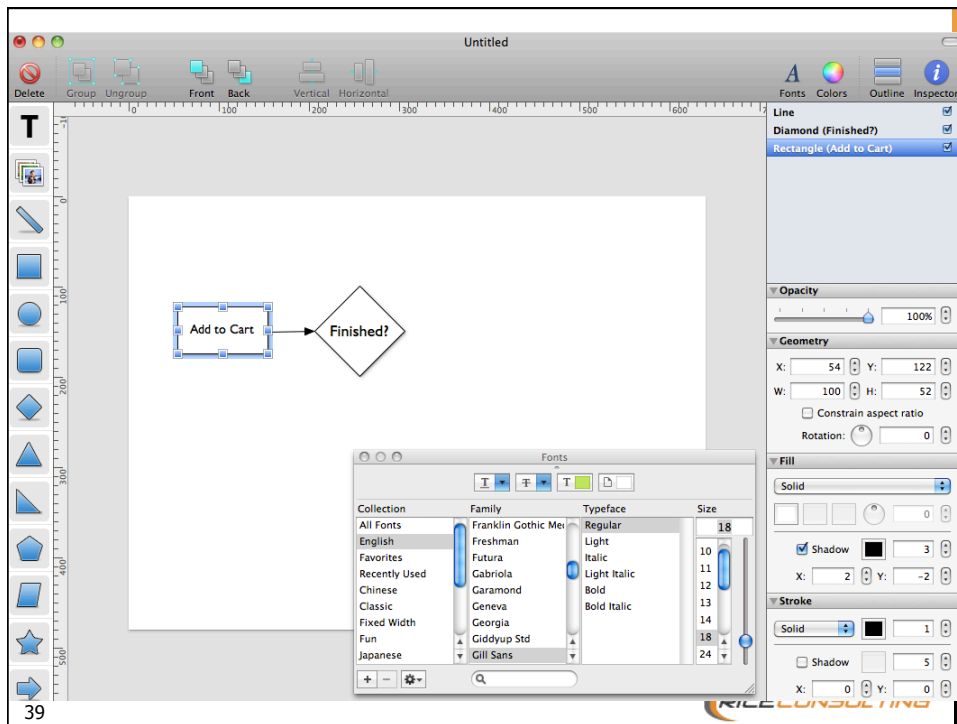
YED GRAPH EDITOR

- **yEd is a powerful desktop application that can be used to quickly and effectively generate high-quality diagrams.**

- **Create diagrams manually, or import your external data for analysis.**

- **Automatic layout algorithms arrange even large data sets with just the press of a button.**

- **yEd is freely available and runs on all major platforms: Windows, Unix/Linux, and Mac OS.**

Free and Cheap Test Tools

YED

Import your own data from an Excel® spreadsheet (.xls) or XML
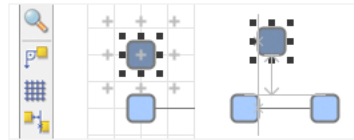
Create diagrams with ease via an intuitive user interface.

Automatically arrange your diagram elements.
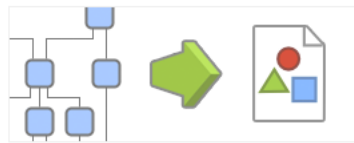
Export bitmap and vector graphics as PNG, JPG, SVG, PDF, SWF

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Supported Diagrams
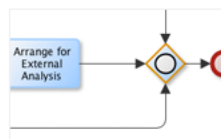
BPMN Diagrams

Flowcharts
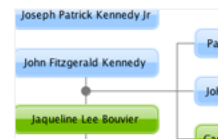
Family Trees
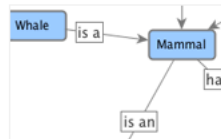
Semantic Networks
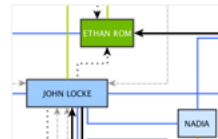
Social Networks
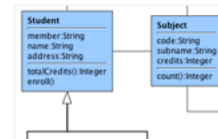
UML Class Diagrams

yEd supports a wide variety of diagram types. In addition to the above illustrated types, yEd also supports organization charts, mind maps, swimlane diagrams, Entity Relationship diagrams, and many more.

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Free and Cheap Test Tools

YWORKS UML DOCLET

- **yWorks UML Doclet, formerly known as yDoc, is a Javadoc™ extension that automatically generates clear and concise UML diagrams from your software project's classes and integrates them into the generated Java API documentation.**

- **yWorks UML Doclet makes use of the world-class layout algorithms provided by our graph visualization library yFiles to generate the UML diagrams.**

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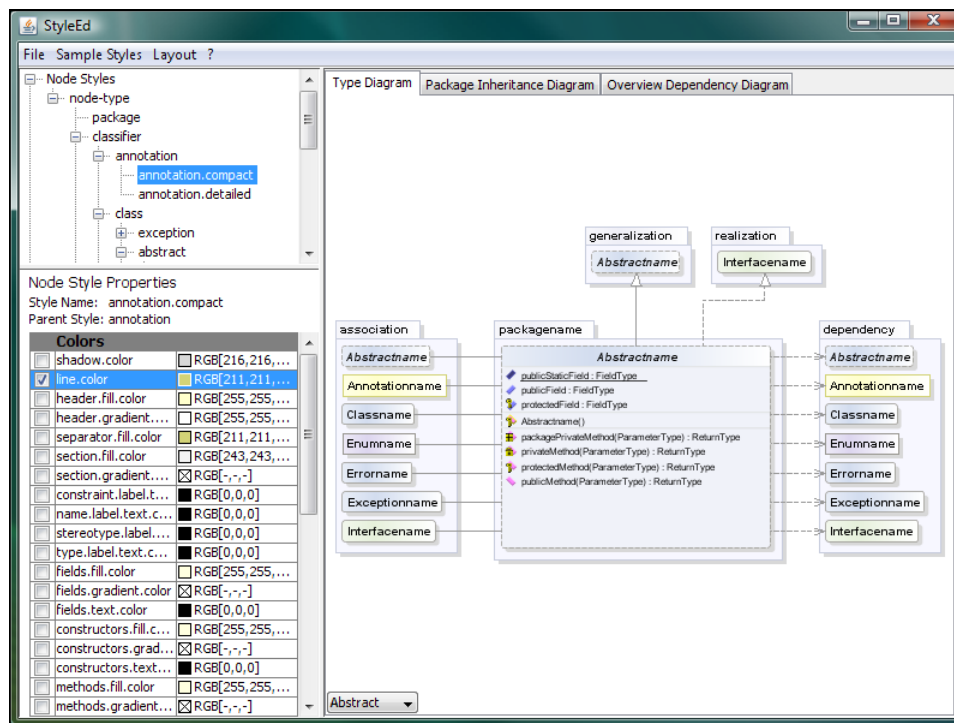
GRAPHWALKER

- **http://graphwalker.org/**
- **GraphWalker is a tool for generating offline and online test sequences from Finite State Machines and Extended Finite State Machines.**
- **The source code is now at github.**
  - https://github.com/KristianKarl/GraphWalker

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SIMPLE FINITE STATE MACHINE MODEL

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OTHERS?

- _____
- _____
- _____
- _____
- _____
- _____

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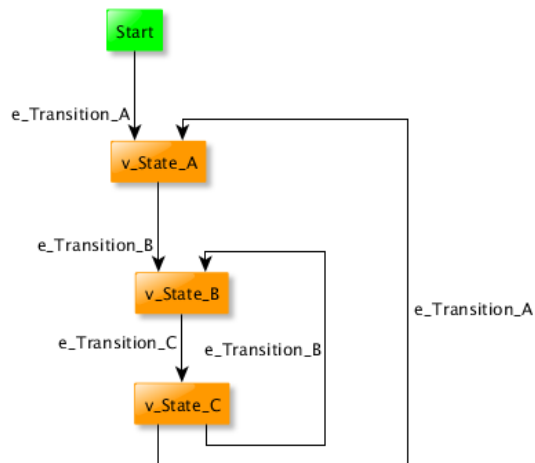
TEST EXECUTION

- **Macro Scheduler**
  - www.mjtnet.com
  - Windows only
  - Row/Column oriented
    - Has object recognition for some Windows objects
    - Will execute VB Script
  - $29 to $195 per individual license
  - $595 for enterprise license
  - Like capture/playback, but no comparison features
  - Has a very robust scripting language

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Free and Cheap Test Tools

MACRO SCHEDULER MAIN INTERFACE
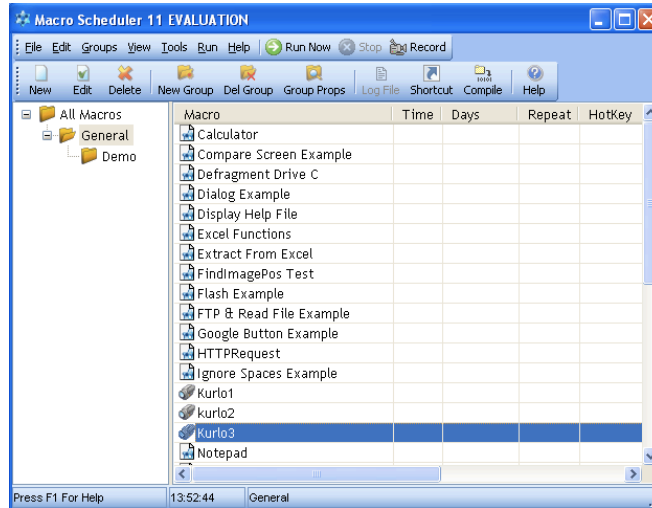
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MACRO SCHEDULER SCRIPT EDITOR

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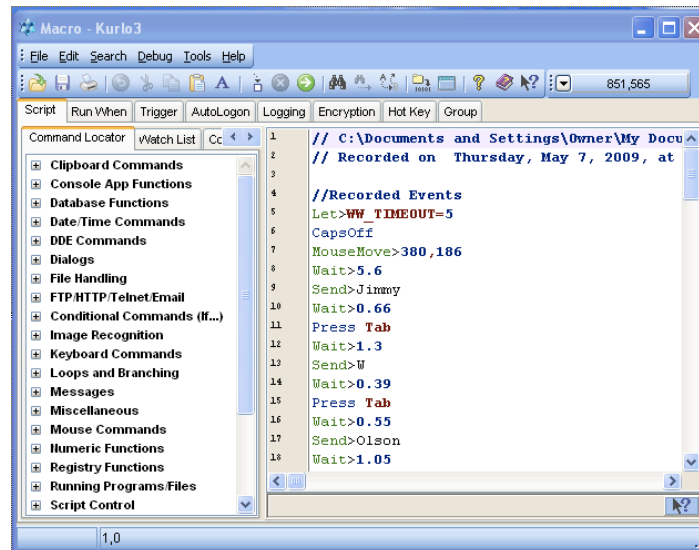
EXAMPLE SCRIPT (1)

```
1   // C:\Documents and Settings\Owner\
2   // Recorded on  Thursday, May 7, 20
3
4   //Recorded Events
5   Let>WW_TIMEOUT=5
6   CapsOff
7   MouseMove>380,186          ← Row, column
8   Wait>5.6
9   Send>Jimmy                 ← Data
10  Wait>0.66
11  Press Tab                  ← Keystroke
12  Wait>1.3
13  Send>W
14  Wait>0.39                  ← Wait time
15  Press Tab
16  Wait>0.55
17  Send>Olson
18  Wait>1.05
19  Press Tab
20  Wait>0.81
21  MouseMove>369,221
22  Wait>0.82
23  LClick
24  Wait>0.16
25  MouseMove>348,246
26  Wait>1.28
```

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EXAMPLE SCRIPT (2)

```
50  Wait>0.45
51  LClick
52  WaitWindowOpen>Address Book Required      ← Object Recognition
53  MoveWindow>Address Book Required,420,313
54  ResizeWindow>Address Book Required,307,124
55  Wait>0.06
56  MouseMove>576,409
57  Wait>2.12
58  LClick
59  WaitWindowOpen>Jimmy Olson                ← Duplicated Data
60  MoveWindow>Jimmy Olson,246,95
61  ResizeWindow>Jimmy Olson,655,561
62  Wait>0.06
63  MouseMove>644,518
64  Wait>2.8
65  LClick
66  Wait>0.14
67  MouseMove>788,635
68  Wait>1.52
69  LClick
70  WaitWindowOpen>Kurlo
71  MoveWindow>Kurlo,-4,-4
72  ResizeWindow>Kurlo,1032,746
73  Wait>0.06
74  MouseMove>929,750
75  Wait>3.51
```

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SAMPLE DATA-DRIVEN SCRIPT

```
4    //Specify the path of the file here
5    Let>k=1
6    Label>start
7    ReadLn>c:\kurlo.txt,k,line
8    If>line=###EOF###,finish
9
10   SetFocus>Kurlo
11   MouseMove>69,7
12   Wait>3
13   LClick
14   Press ALT
15   Send>c
16   Release ALT
17   Wait>1.27
18   Press Enter
19   Wait>3.16
20   Send>%line%
21   Wait>1.33
22   Press Tab
23   Wait>1.3
24   Let>k=k+1
25   ReadLn>c:\kurlo.txt,k,line
26   Send>%line%
27   Wait>0.49
```

Test Data File → (line 7)
Loop ← (line 8)
Read from file → (line 25)
Input to screen ← (line 26)

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SELENIUM IDE

- **Firefox add-on that records clicks, typing, and other actions to make a test, which you can play back in the browser.**
  - Not just a recording tool: it is a complete IDE.
  - You can choose to use its recording capability, or you may edit your scripts by hand.
  - Autocomplete support and the ability to move commands around quickly.
  - http://seleniumhq.org

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SELENIUM IDE FEATURES

- **Easy record and playback**
- **Intelligent field selection will use IDs, names, or XPath as needed**
- **Autocomplete for all common Selenium commands**
- **Walk through tests**
- **Debug and set breakpoints**
- **Save tests as HTML, Ruby scripts, or any other format**

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SELENIUM IDE FEATURES (2)

- **Support for Selenium user-extensions.js file**
- **Option to automatically assert the title of every page**
- **NEW! Easy customization through plugins**

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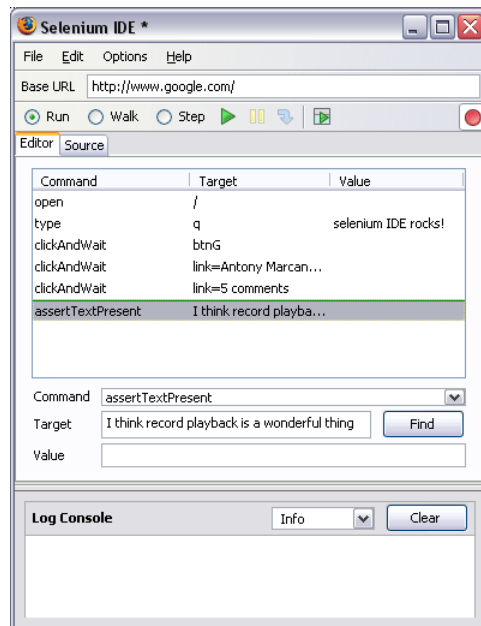
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IMACROS

iMacros for Firefox 7.4.0.8
by iOpus

Automate Firefox. Record and replay repetitious work. If you love the Firefox web browser, but are tired of repetitive tasks like visiting the same sites every days, filling out forms, and remembering passwords, then iMacros for Firefox is the solution you've been dreaming of! ***Whatever you do with Firefox, iMacros can automate it.***

+ Add to Firefox

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Free and Cheap Test Tools

CUBIC TEST

- **CubicTest is a graphical Eclipse plug-in for writing Selenium and Watir tests.**
- **CubicTest's test editor is centered around pages/states and transitions between these pages/states.**
- **CubicTest features an innovative test recorder and test runner based on Selenium RC which are fully integrated with the graphical test editor.**

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CUBIC TEST (2)

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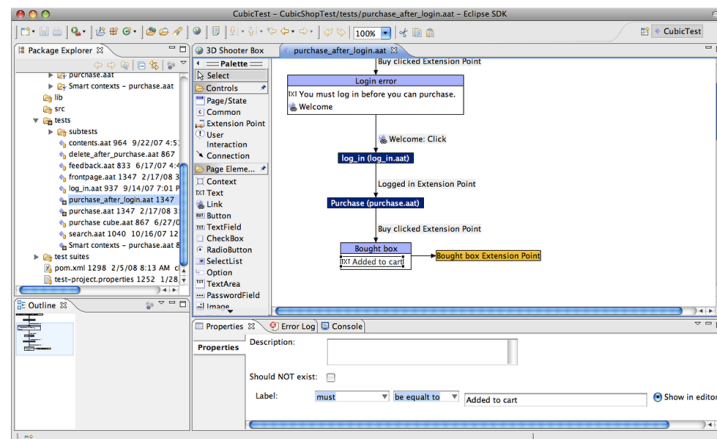
Free and Cheap Test Tools

BAD BOY
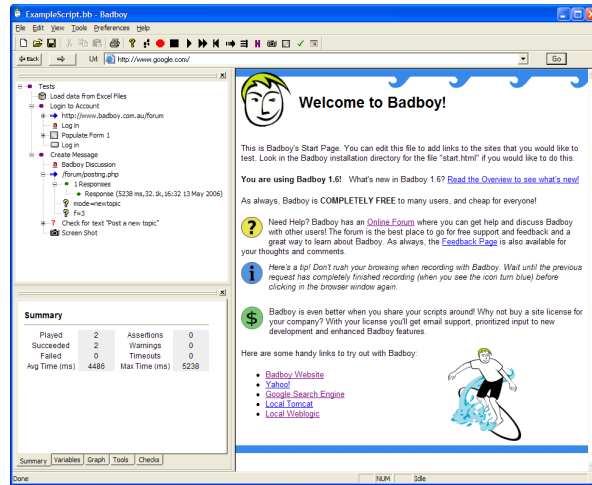
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BAD BOY (2)

- **Record/playback**
- **Free for individuals and deployments of 5 computers or less & not-for-profits**
- **$45/user license fee otherwise**
- **http://www.badboy.com.au/**

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CUCUMBER

- **Cucumber is a tool that executes plain-text functional descriptions as automated tests.**
- **The language that Cucumber understands is called Gherkin**
- **http://cukes.info/**

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CUCUMBER LANGUAGE EXAMPLE

```
Feature: Search courses
  In order to ensure better utilization of courses
  Potential students should be able to search for courses

  Scenario: Search by topic
    Given there are 240 courses which do not have the topic "biology"
    And there are 2 courses A001, B205 that each have "biology" as one of the topics
    When I search for "biology"
    Then I should see the following courses:
      | Course code |
      | A001        |
      | B205        |
```

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SIKULI

- **Sikuli is an open source visual technology to automate and test graphical user interfaces (GUI) using images (screenshots).**

- **Sikuli includes Sikuli Script, a visual scripting API for Jython, and Sikuli IDE, an integrated development environment for writing visual scripts with screenshots easily.**

- **You can programmatically control a web page, a Windows/Linux/Mac OS X desktop application, or even an iphone or android application running in a simulator or via VNC.**

- **http://sikuli.org/**

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SIKULI SCRIPTING

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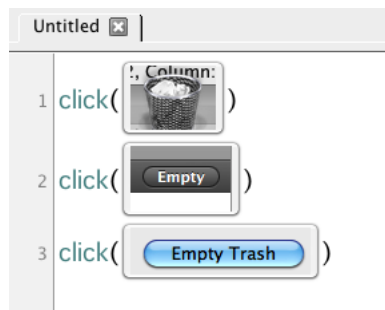
Free and Cheap Test Tools

ICUTEST

- **GUI Unit testing for Windows Presentation Foundation**
- **Free**
- **Test Generator is a tool that automatically creates GUI unit tests for your application. Just specify your assembly (executable or DLL) and Test Generator will inspect your assembly for UI components and generate unit tests automatically.**
- **http://www.nxs-7.com/icu/Default.aspx**

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ICUTEST TEST GENERATOR

71
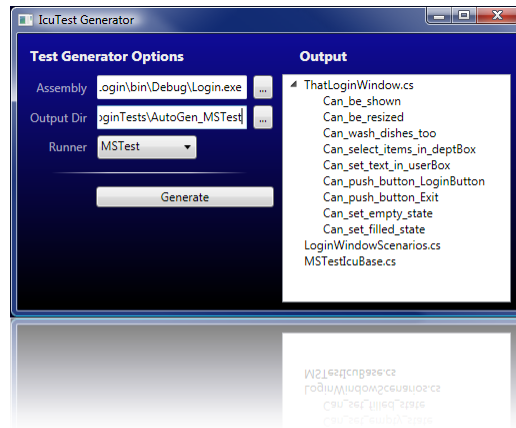
FAKE

- **Mac OS X Web Test Automation**
  - Forms
  - Screenshot capture
  - Assertions
  - Error handling
- **$29.95**
- **www.fakeapp.com**

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KEYNOTE MITE
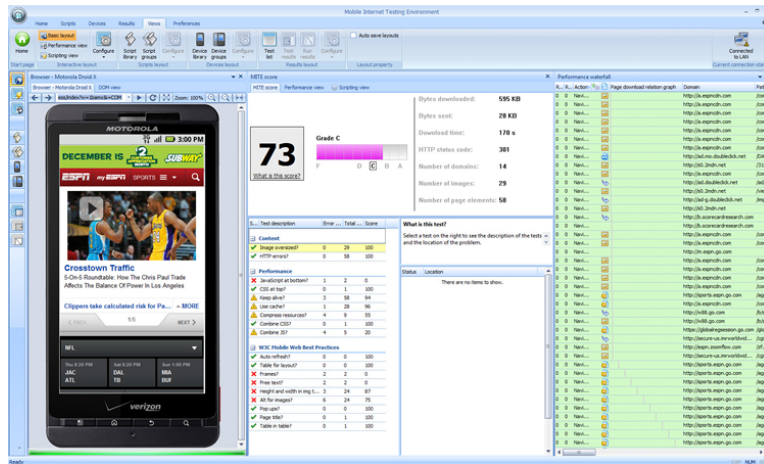
73

OTHER FREE TEST EXECUTION TOOLS

- **FitNesse -** http://fitnesse.org
- **WATIR -** http://watir.com/
- **Apodora -** http://sourceforge.net/projects/apodora/
- **AutoIT -** http://www.autoitscript.com/autoit3/index.shtml
- **Auto Hot Key** – www.autohotkey.com
- **Frankenstein –** http://frankenstein.openqa.org/
- **WET -** Commercial grade open source Web automation testing tool **-** http://wet.openqa.org
- **Grease Monkey**
  - http://testertools.com/browsers-based-tools/grease-monkey-web-testing-tool-with-scripts/

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OTHERS?

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TEST AUTOMATION FRAMEWORKS

- **Our working definition:**
  - A framework is a hierarchical directory that encapsulates shared resources, such as a dynamic shared library, image files, localized strings, header files, and reference documentation in a single package.

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OPEN SOURCE FRAMEWORKS

- **Open2Test**
  - http://www.open2test.org
- **Robot Framework**
  - http://code.google.com/p/robotframework/
- **STAF – Software Testing Automation Framework**
  - http://staf.sourceforge.net/
- **SAFS - Software Automation Framework Support (SAS)**
  - http://sourceforge.net/projects/safsdev/

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OPEN2TEST

- **Open2Test is a keyword-driven automation framework that works with HP QuickTest Professional (QTP) and many other test execution tools.**

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OPEN2TEST (2)

- **Allows testers to develop test cases using Microsoft Excel and a list of keywords.**

- **When the test is executed, the framework processes the Excel workbook and calls functions associated with the keywords entered in the Excel spreadsheet.**

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FRAMEWORK ARCHITECTURE

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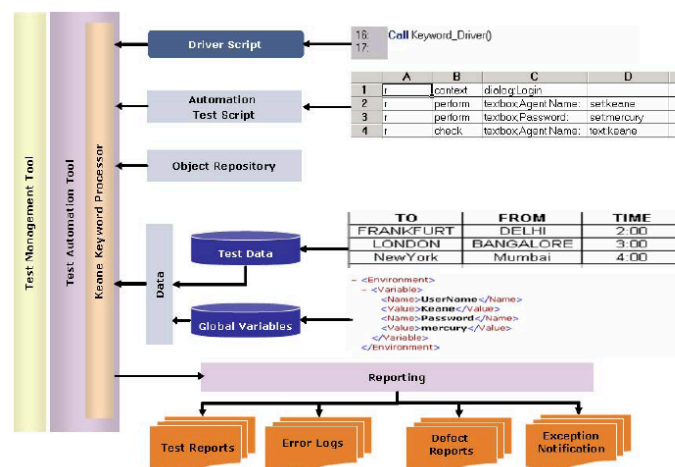
OPEN2TEST (3)

- **These keyword functions in turn perform specific actions against the application under test (AUT).**
  - The framework interprets the keyword and executes a set of statements in the program.

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FRAMEWORK FLOW

82
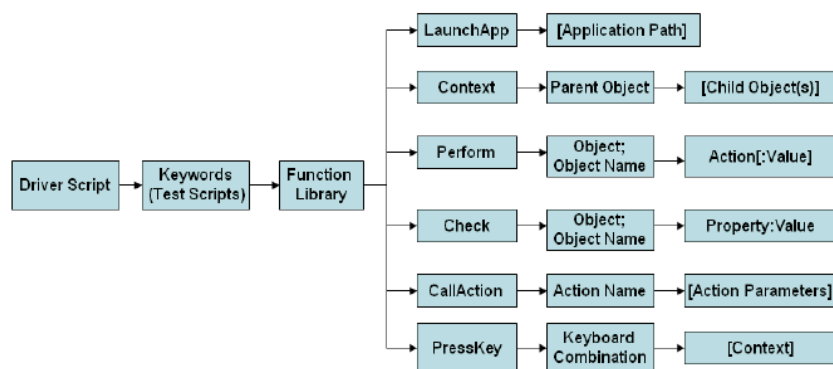
OPEN2TEST (4)

- **With this framework in place, applications can be automated without starting from scratch.**
  - Testers simply use the application independent keywords and create extra application-specific keywords.

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OPEN2TEST FEATURES

- **Use of variables**
  - Variables can be defined and used across the generated test script.
- **Conditional checking**
  - Conditional constructs such as 'if' can be implemented using keywords to handle different flows based on various conditions.

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OPEN2TEST FEATURES (2)

- **Data-driven testing**
  - This framework supports data-driven testing by importing data from an external data sheet.
- **Reports**
  - Customized reporter messages can also be used to perform effective analysis on execution reports.

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OPEN2TEST FEATURES (3)

- **Calling functions and reusable actions**
  - Common functions or actions can be triggered through keywords.
- **Keyboard inputs**
  - This plug-in is included to perform keyboard actions on the specified test object.

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OPEN2TEST FEATURES (4)

- **Date/time functions**
  - The date/time function plug-in is included to perform different operations on date/time.
- **Exception handling**
  - Runtime errors can be effectively handled and reported using this framework.
- **Handling object (Web or windows)**
  - Some operations can be performed on the Web or as a Windows Object using keywords, depending on the execution tool.
- **Learn More at http://www.open2test.org**

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ROBOT FRAMEWORK

- **Robot Framework is a generic test automation framework for acceptance testing and acceptance test-driven development (ATDD).**

- **Has easy-to-use tabular test data syntax and utilizes the keyword-driven testing approach.**

- **Can be extended by test libraries implemented either with Python or Java, and users can create new keywords from existing ones using the same syntax that is used for creating test cases.**

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Free and Cheap Test Tools

ROBOT FRAMEWORK (2)

Running Keyword Conditionally

Setting	Value	Value	Value	Value
Documentation	Adding conditions to test cases should be avoided if possible. However, sometimes that kind of construct is needed. For this purpose BuiltIn library contains keywords "Run Keyword If" and "Run Keyword Unless" which use is demonstrated in this suite.			

Variable	Value	Value	Value	Value
${COUNTRY}	Robotland			

Test Case	Action	Argument	Argument	Argument
Running Test Based On The Condition	[Documentation]	If you change \${COUNTRY} value or give --variable COUNTRY:your_country from command line the test is executed differently than with default value.		
	Run Keyword If	'Robotland' == '${COUNTRY}'	Hello World	
	Run Keyword Unless	'Robotland' == '${COUNTRY}'	Log	Hello ${COUNTRY}!

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ROBOT FRAMEWORK (3)

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ROBOT FRAMEWORK (4)

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SELENIUM LIBRARY

- **SeleniumLibrary is a Robot Framework test library that uses the popular Selenium web testing tool internally.**

- **It provides a powerful combination of simple test data syntax and support for different browsers.**

- **In addition to standard web testing, the library also supports testing Adobe Flex/Flash applications.**

- **http://code.google.com/p/robotframework-seleniumlibrary/**

- **http://code.google.com/p/robotframework-seleniumlibrary/ wiki/Demo**

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STAF

- **The Software Testing Automation Framework (STAF) is an open source, multi-platform, multi-language framework designed around the idea of reusable components, called services (such as process invocation, resource management, logging, and monitoring).**

- **http://staf.sourceforge.net/**

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STAF OVERVIEW

- **This is simply an overview of this environment framework.**
  - You can see full documentation at http://staf.sourceforge.net/

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STAF OVERVIEW (2)

- **Peer-to-peer pluggable framework geared towards test automation**
- **History**
  - Created at IBM Austin in 1998
  - Corporate funded (via QSE) since 1999
  - Open-sourced (on SourceForge) in 2001
  - Licensed under the Eclipse Public License (EPL) V1.0

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STAF OVERVIEW (3)

- **User Community**

  - 240+ IBM teams (world-wide)
  - 220+ external companies
  - 280k+ downloads of STAF and associated plug-ins since 4Q/2001
  - Consistently ranked as one of the Top 50 projects on SourceForge.net

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STAF OVERVIEW (4)

- **An open source automation framework**
- **A remote test agent to control tests on multiple machines**
- **Designed around the idea of reusable components, called services**
- **Developed by IBM, made open source because of their use in Linux testing**

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STAF OVERVIEW (5)

- **Runs as a daemon process, called STAFProc, on each system**
- **Operates in a peer-to-peer environment; in other words, there is no client-server hierarchy.**

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Free and Cheap Test Tools

STAF OVERVIEW (6)

- STAF operates in a peer-to-peer environment; in other words, there is no client-server hierarchy among machines running STAF

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STAF OBJECTIVES

- **STAF was designed with the following objectives in mind:**
  - Minimum machine requirements - This is both a hardware and a software statement.
  - Easily useable from a variety of languages, such as Java, C/C++, Rexx, Perl, and Tcl, or from a shell (command) prompt.
  - Easily extendable - This means that it should be easy to create other services to plug into STAF.

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STAF OBJECTIVES (2)

- **To make it easier to create automated test cases and workloads.**
- **To increase the efficiency, productivity, and quality of your testing by improving your level of automation and reuse in individual test cases as well as the overall test environment.**

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STAF AS AUTOMATION TOOLKIT

- **STAF is quick and easy to get started with**
  - Takes less than 3 minutes to get running on most systems

- **STAF is very easy to use**
  - All services have built-in syntax help
  - All services are available from the command line

- **STAF provides many valuable built-in services**
  - Many more are available for download
  - Writing your own services is very straightforward

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STAF SUPPORTED PLATFORMS

- **STAF is available for the following platforms**
  - Windows: 2000, 2003, XP, Vista, Server 2008 (Intel, AMD64, IA/64)
  - Linux: All platforms (i386, AMD64, IA/64, PPC64, PPC32, zLinux32, zLinux64)
  - AIX 5.1+ (32- and 64-bit)
  - Solaris 2.6+ + (Sparc 32/64, x64, x86)
  - HP-UX 11.00+ (PA-RISC, IA/64)
  - FreeBSD 4.10+
  - Mac OS X 10.4+ (i386, PPC)
  - OS/400 V5R2+
  - z/OS 1.4+ (32- and 64-bit)

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STAF SUPPORTED LANGUAGES

- **STAF supports the following languages**
  - Java, C/C++
  - Perl, Python, Tcl, Rexx, Shell-script
  - Ant
  - Command line

- **STAF "feels" the same across all platforms and languages**

- **There is also a command line interface**

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THE STAF WEB SITE

- **The main STAF web site is**
  - http://staf.sourceforge.net
- **From this web site you can:**
  - Submit bugs and feature requests
  - View the STAF source code
  - Download the STAF binary files
  - Download STAF services
  - View STAF documentation
  - Access Mailing Lists to view, search, and post messages (Help, Announcements)
  - Access Forums to view, search, and post messages

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Software Testing Automation Framework (STAF)

Welcome to STAF

The Software Testing Automation Framework (STAF) is an open source, multi-platform, multi-language framework designed around the idea of reusable components, called services (such as process invocation, resource management, logging, and monitoring). STAF removes the tedium of building an automation infrastructure, thus enabling you to focus on building your automation solution. The STAF framework provides the foundation upon which to build higher level solutions, and provides a pluggable approach supported across a large variety of platforms and languages.

Latest Releases

- **STAF 3.3.1** (September 24, 2008) (Download)
- **STAX 3.3.4** (September 24, 2008) (Download)

Other STAF Services (provided separately as "add-ons" to the core STAF services):

- **Cron Service 3.3.3** (September 24, 2008) (Download)
- **Email Service 3.3.2** (September 24, 2008) (Download)
- **Event Service 3.1.2** (September 24, 2008) (Download)
- **EventManager Service 3.3.3** (September 24, 2008) (Download)
- **FSExt (File System Extension) Service 3.0.1** (February 27, 2008) (Download)
- **HTTP Service 3.0.1** (September 24, 2008) (Download)
- **NamedCounter Service 3.0.1** (February 27, 2008) (Download)
- **Namespace Service 1.0.1** (February 27, 2008) (Download)
- **SXE (Staf eXecution Engine) Service 3.0.2** (February 27, 2008) (Download)
- **Timer Service 3.0.2** (February 27, 2008) (Download)

STAF can be leveraged to help solve common industry problems, such as more frequent product cycles, less preparation time, reduced testing time, more platform choices, more programming language choices, and increased National Language requirements. STAF can help in these areas since it is a proven and mature technology, promotes automation and reuse, has broad platform and language support, and provides a common infrastructure across teams.

STAX is an execution engine which can help you thoroughly automate the distribution, execution, and results analysis of your testcases. STAX builds on top of three existing technologies, STAF, XML, and Python, to place great automation power in the hands of testers. STAX also provides a powerful monitoring application which allows you to interact with and monitor the progress of your jobs. Some of the main features of STAX are: support for parallel execution, user-defined granularity of execution control, support for nested testcases, the ability to control the length of execution time, the ability to import modules at run-time, support for existing Python and Java modules and packages, and the ability to extend both the STAX language as well as the STAX monitoring application. Using these capabilities, you can build sophisticated scripts to automate your entire test environment, while ensuring maximum efficiency and control.

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Software Testing Automation Framework (STAF)

Download STAF V3

The latest releases for STAF V3 can be downloaded from this page. If you want to download the latest releases for STAF V2, go to the Download STAF V2" page instead. Earlier releases of STAF can be accessed from the "See All Releases" page.

See the STAF V3 History page for STAF V3 history information.
See the STAF V3 Overview if you are migrating from STAF V2 to get more information on major new enhancements in STAF V3.
See the Getting Started with STAF V3 Guide for more information about how to get started using STAF V3.
See the Programmatically retrieving the latest STAF releases page for more information about how to programmatically retrieve the latest STAF releases.

Binaries

The recommended installation method for STAF is to use InstallAnywhere (IA). However, if we haven't yet provided an InstallAnywhere file, use the GNU zipped or compressed tar file, if provided, to do a STAFInst install.

See the STAF V3 Installation Guide for more detailed instructions for installing STAF V3.

The latest STAF V3 release is STAF V3.3.1. Files which are not at the latest release level are marked with an asterisk (*).

Note that AMD64 is also commonly known as x86-64 or x64 or Opteron 64-bit. AMD64 should not be confused with the Intel Itanium architecture, also known as IA-64, which is not compatible on the native instruction set level with the AMD64 architecture.

Operating System (Architecture)	Java Support	Release	File	File format	File size
Win95/98/Me/NT/2000/XP/2003/ Vista/WinSrv2008 (32-bit)	32-bit	3.3.1	STAF331-setup-win32.exe	InstallAnywhere (Bundled JVM)	47M
Win95/98/Me/NT/2000/XP/2003/ Vista/WinSrv2008 (32-bit)	32-bit	3.3.1	STAF331-setup-win32-NoJVM.exe	InstallAnywhere (No JVM)	13M
Windows Server 2003/2008 (IA64)	64-bit	3.3.1	STAF331-setup-win64.exe	InstallAnywhere (Bundled JVM)	52M
Windows Server 2003/2008 (IA64)	64-bit	3.3.1	STAF331-setup-win64-NoJVM.exe	InstallAnywhere (No JVM)	15M
Windows Server 2003/2008, Vista (AMD64, aka x64)	64-bit	3.3.1	STAF331-setup-winamd64.exe	InstallAnywhere (Bundled JVM)	54M

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PERFORMANCE TESTING & MONITORING TOOLS

- **Paessler Web Server Stress Tool**
- **SmartInspect**
- **loadUI**
- **SOASTA CloudTest Lite**
- **BrowserMob**

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Free and Cheap Test Tools

SMARTINSPECT

- **.NET, Java and Delphi logging tool for debugging and monitoring software applications.**

- **Helps identify bugs, find solutions to user-reported issues and gives a precise picture of how software performs in different environments.**

- **One-time license**
  - $299 single user
- **http://www.gurock.com/smartinspect/**

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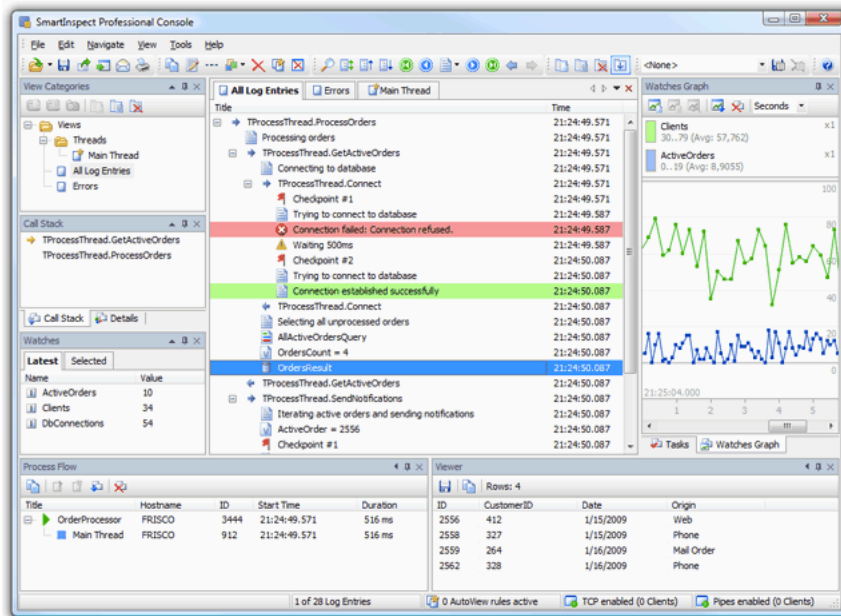
NETWORK MONITORING

- **Axence NetTools Pro – www.axencesoftware.com**
- **FREE and very comprehensive set of network administration tools:**
  - NetWatch - network monitoring with alerting, real-time & historical charts;
  - WinTools lists exhaustive system information from Windows computers;
  - Port scanner; network scanner;
  - NetStat lists local inbound & outbound connections;
  - TCP/IP workshop for low level service testing; ping; fast traceroute;
  - DNS lookup; bandwidth test tool; SNMP browser and more.

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AXENCE NETTOOLS PRO

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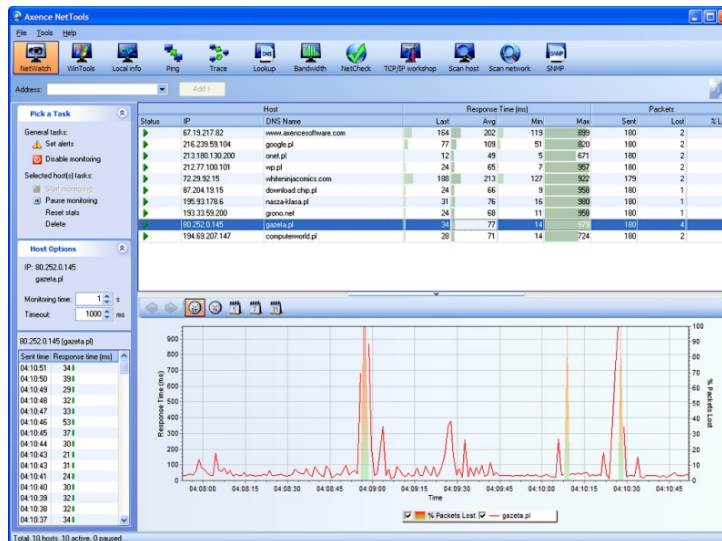
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Free and Cheap Test Tools

PAESSLER WEB SERVER TEST

- **www.paessler.com**
  - Pro edition single user - $249
    - 100 Concurrent virtual users
  - Enterprise edition single user - $750
    - Up to 10,000 concurrent virtual users
  - Enterprise edition 5 user - $1,449
  - Enterprise edition site license - $2,895

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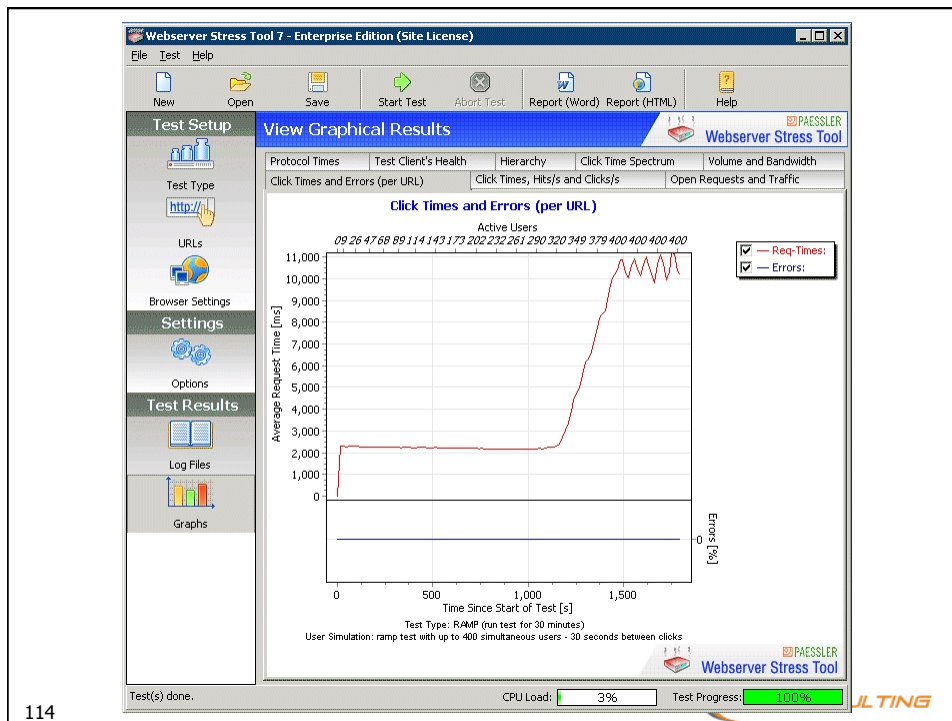
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Free and Cheap Test Tools

PAESSLER PRTG NETWORK MONITORING

- **www.paessler.com**
  - Free for up to 10 sensors
  - Up to 100 sensors - $400
  - Up to 500 sensors - $1,200

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Group: Root (365 days)
System

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Free and Cheap Test Tools

Free and Cheap Test Tools

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OTHER MONITORING TOOLS

- **PerfMon – Windows**
- **Wireshark**
- **Nagios**
- **Iometer**
  - Iometer is an I/O subsystem measurement and characterization tool for single and clustered systems.
  - It is used as a benchmark and troubleshooting tool and is easily configured to replicate the behavior of many popular applications. One commonly quoted measurement provided by the tool is IOPS.
  - http://www.iometer.org/

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Free and Cheap Test Tools

IOMETER
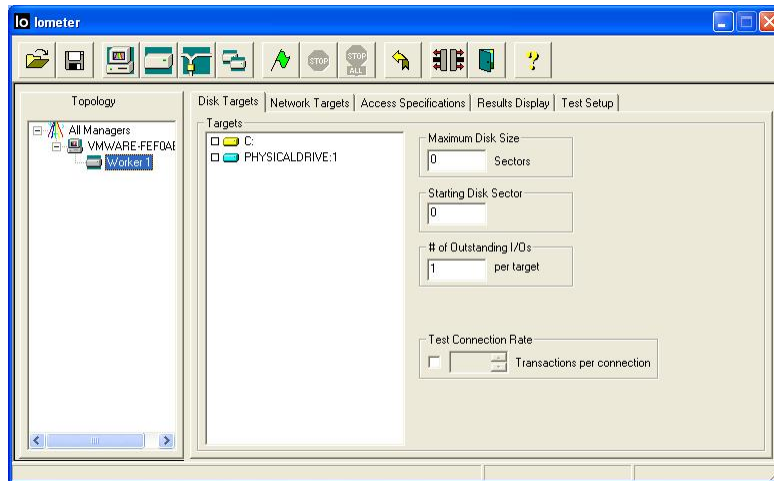
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MEMORY TEST TOOLS

- **Memory Validator**
  - The vendor, Software Verification, provides software tools for compiled languages and dynamic languages.
  - The toolset concentrates on the core activities of code coverage, memory leak detection, performance profiling, deadlock detection and flow tracing.
  - Pricing for some products is free, and ranges from $199 USD to $695 USD for singe-seat suite licensing. ($4,170 USD for 10 developers)

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Free and Cheap Test Tools

Memory Leaks

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Memory Coverage

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LOADUI

- **loadUI is a free and open source cross-platform Load Testing solution.**

- **With a visual, drag-and-drop interface, it allows you to create, configure and redistribute your Load Tests interactively and in real-time.**

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LOADUI

- **loadUI generates scalable, high-volume and real-world load from any number of local and remote computers.**

- **In a single test environment, loadUI provides complete test coverage and supports all the standard protocols and technologies.**

- **www.smartbear.com**

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Free and Cheap Test Tools

The Project Canvas, loadUI's main working area, showing a simple Load Test scenario.

Distribution of two TestCases to the cloud (Amazon EC2) and two remote servers.

Free and Cheap Test Tools

soapUI Integration - A soapUI TestCase running against a soapUI MockService.

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Logging of Assertion Failures by connecting the output of an Assertion component to a TableLog.

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Free and Cheap Test Tools

A Statistics diagram (graph) that is updated in real-time, and its Settings pane.

131

Simple Web Load Test involving Fixed Rate Generator, Web Page Runner and Statistics components.

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Testing of five Web pages by running them both in parallel and sequence.

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SOASTA CLOUDTEST LITE

- **CloudTest® Lite, SOASTA's free downloadable edition, delivers rapid test creation and real-time analytics for functional testing and frequent, lower-scale performance testing throughout the application development life cycle.**

- **Free for 100 virtual users or less**

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SOASTA CLOUDTEST LITE (2)

- **Build, compose, run and analyze functional and performance tests of any complexity**
- **Validate Web and mobile applications up to 100 simultaneous users**
- **Run tests as often as needed in every phase of development and delivery**
- **Test modern web technologies like HTML5, Flash/Flex and Silverlight as well as SOAP and REST web services**

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SOASTA CLOUDTEST LITE (2)

- **Analyze end-to-end performance with real-time, in-memory analytics during test execution**
- **Build tests that can be run at large scale with CloudTest On-Demand or other Editions**
- **Evaluate CloudTest for larger scale and broader deployment for your team**
- **http://www.soasta.com/cloudtest/lite/**

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Free and Cheap Test Tools

SOASTA CLOUDTEST LITE (3)
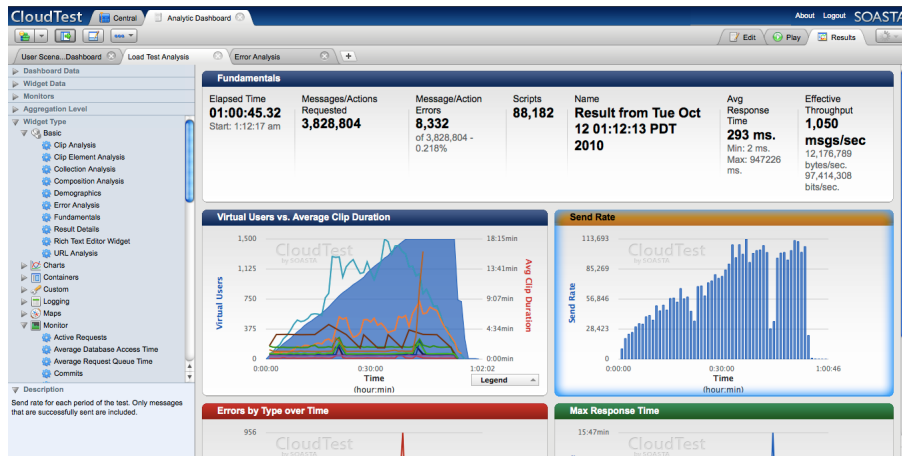
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SOASTA CLOUDTEST LITE (4)

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SOASTA CLOUDTEST LITE (5)
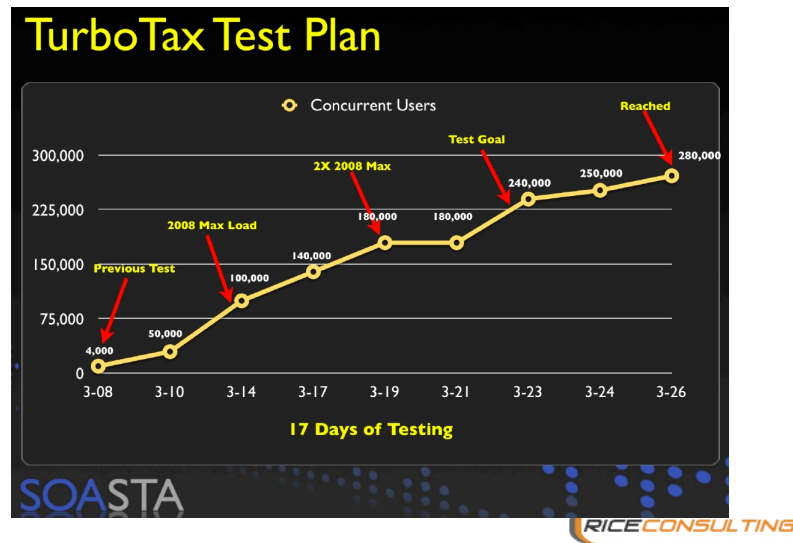
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BROWSER MOB

- **Cloud-based performance testing and monitoring.**
- **Some free plans and open source products**
  - Free – 100 Virtual Users
- **Other plans start at $49/mo for monitoring and $499 for performance testing.**
- **https://browsermob.com/performance-testing**

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OTHER NOTABLE FREE LOAD TEST TOOLS

- **Apache Jmeter -** http://jakarta.apache.org/jmeter/
- **fwptt -** http://fwptt.sourceforge.net/
  - For web applications
- **The Grinder -** http://grinder.sourceforge.net/
  - For Java applications
- **OpenSTA -** http://www.opensta.org/

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OTHERS?

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TEST MANAGEMENT

- **Testopia**
  - Testopia is a test case management extension for Bugzilla.
  - It is designed to be a generic tool for tracking test cases, allowing for testing organizations to integrate bug reporting with their test case run results.
  - Though it is designed with software testing in mind, it can be used to track testing on virtually anything in the engineering process.
  - http://sourceforge.net/projects/testopia

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Free and Cheap Test Tools

QAMANAGER

- **Web-based application used for keeping track of engineering and customer releases of Software Projects, Resource allocations and related information.**
- **It helps QA Managers to keep track of releases effectively.Powered by OpenXava and Java.**
- **http://sourceforge.net/projects/qamanager**

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QAMANAGER (2)

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Free and Cheap Test Tools

TESTMASTER

- **A test case logging, reporting and test automation tool, much like the commercial product Test Director.**
- **http://testmaster.sourceforge.net/**

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Free and Cheap Test Tools

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Free and Cheap Test Tools

Free and Cheap Test Tools

ZETA TEST

- **Zeta Test is an integrated test management environment that enables you to perform black-box tests, white-box tests, regression tests or change management tests of software applications.**

- **Zeta Test helps you to plan, perform, log, monitor and document the tests, and then to evaluate the test results.**

- **Cost – Free**

- **www.zeta-test.com**

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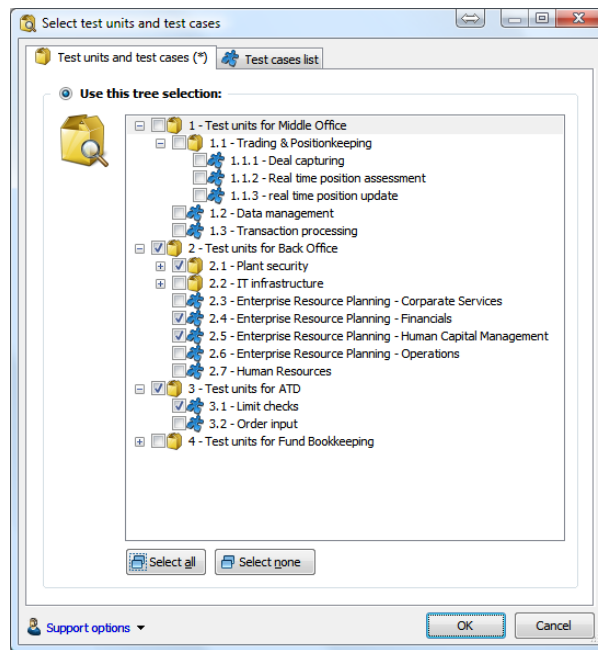
Free and Cheap Test Tools

XQUAL

- **Free at http://www.xqual.com**
- **XStudio is a fully-graphical application developed in Java (so theoretically deployable on any OS).**
- **All of the data are organized within trees for more flexibility.**
- **Integrated management - All entities involved in the QA/testing projects are managed by XStudio.**
  - This makes lots of metrics/statistics/status generation much more easier.

155
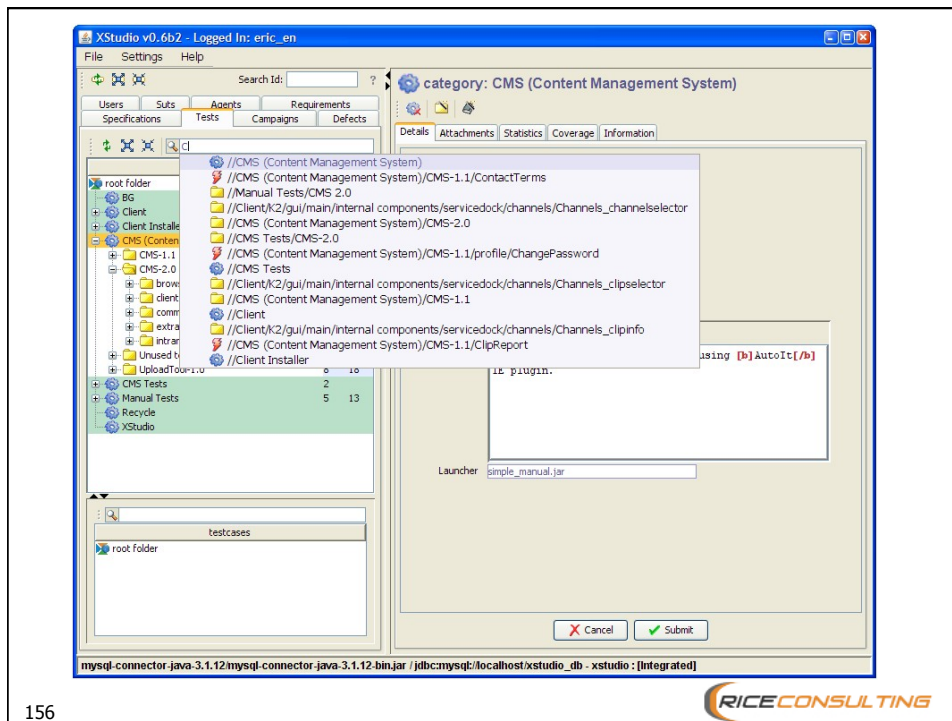
156

Free and Cheap Test Tools

QA BOOK

- **Windows-based**
- **Allows you to create, edit and manage requirements, test cases, defects, environments, project success criteria, reporting, automated testing and more.**
- http://www.freetestmanagementtool.com/Free

157

158

Free and Cheap Test Tools

Free and Cheap Test Tools

Free and Cheap Test Tools

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BROMINE

- **Part of the Selenium suite of tools**
- **Web-based QA tool for Selenium, that enables you to easily run Selenium-RC tests and view the results.**
- **It scales from the single tester that just wants to run some tests without all the hassle to the corporate solution with multiple user-groups and hundreds of test cases.**
- **http://bromine.seleniumhq.org/**

164

TESTLODGE

- **Online test case management tool, allowing you to manage test plans, test cases and test runs.**

- **4 plans from $12 to $99 / month**

- **www.testlodge.com**

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TESTLINK

- **TestLink is web based Test Management system.**

- **The latest documentation is available on www.teamst.org or testlink.sourceforge.net.**

- **http://www.teamst.org**

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Free and Cheap Test Tools

Illustration 2: Functionality overview

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TEST SUITE VIEW

168
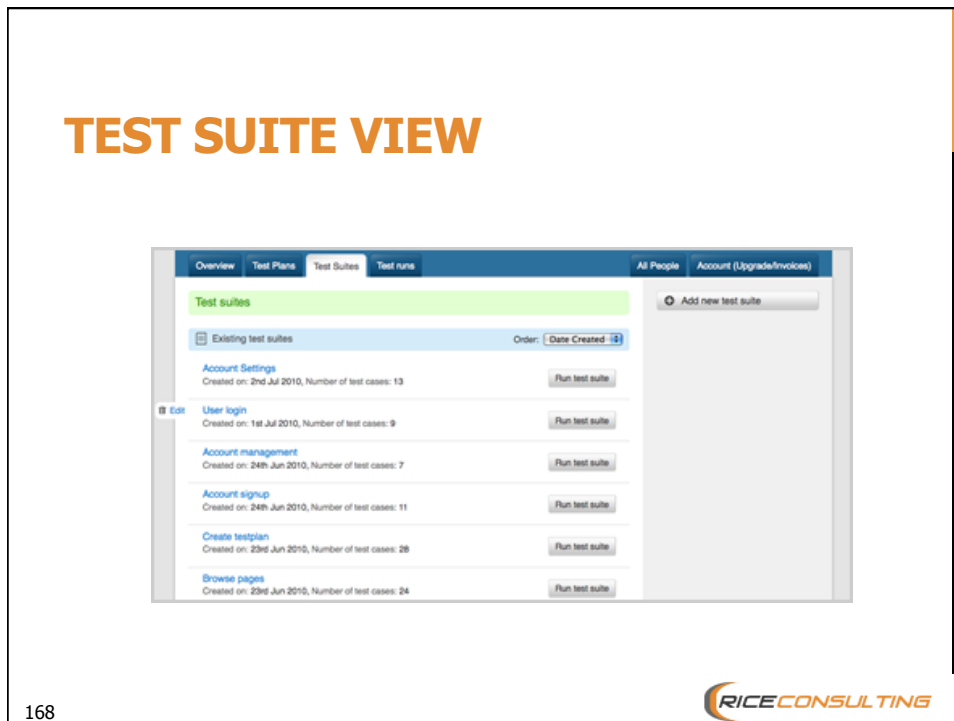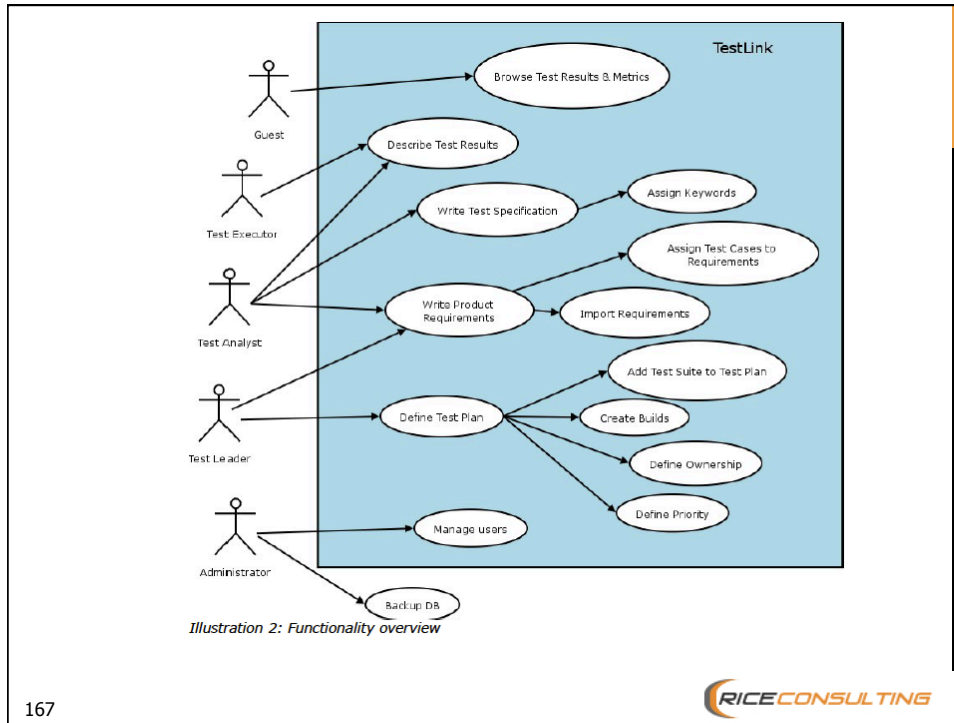
TEST RUN VIEW
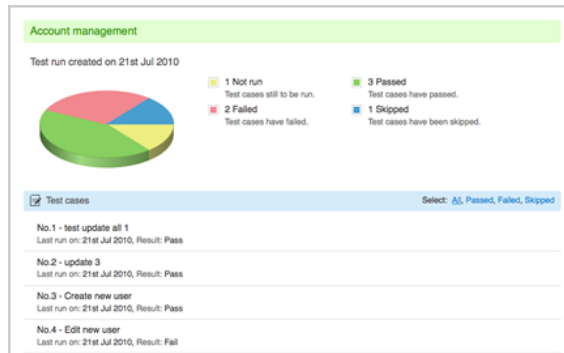
169

TESTRAIL

- **Web-based, hosted on your own server**
- **Track and follow the status of individual tests, milestones and projects with dashboards and activity reports.**
- **One-time licensing**
  - Ranges from $239 (1 user) to $7,000 (50 users)
- **http://www.gurock.com/testrail/**

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Free and Cheap Test Tools

Free and Cheap Test Tools

TEST RUN

- **http://www.runtestrun.com/**
- **Web-based, hosted**
- **Pricing from $10/mo (single user) to $50/mo. (unlimited users)**

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Free and Cheap Test Tools

Free and Cheap Test Tools

RTH - REQUIREMENTS AND TESTING HUB

- **An open source tool for managing requirements and test cases.**
- **Available for download, but seems to be inactive in terms of maintenance.**
- http://sourceforge.net/projects/rth/

Free and Cheap Test Tools

Free and Cheap Test Tools

AXIOM

- **Free**
- **Build and manage requirements and use cases in an agile environment.**
- **Features such as tracing, reporting and history making it effortless to increase software quality and reduce complexity.**
- **www.iconcur-software.com**

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ICE SCRUM

- **Open source**
- **Agile scrum management**
- **Helps in implementing the key agile practices: vision, features, user stories, effort estimation with Planning Poker, task board, etc.**
- **Tracks stories, defects and more.**
- **http://www.icescrum.org/en/**

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Free and Cheap Test Tools

Main Dashboard

Cumulative Stories

ICE SCRUM (4)

Tasks by Sprint

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OTHERS?

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Free and Cheap Test Tools

TEST DATA GENERATION

- **Generatedata.com**
  - www.generatedata.com
  - Creates test data in a variety of forms:
    - Text, cvs, XML, Excel, SQL
  - Free and Cheap Subscriptions Available
- **DBFeeder - Free**
  - Automatically generate test data for Oracle Databases which fits primary and foreign keys of tables.
  - http://dbfeeder.sourceforge.net/index.html

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Free and Cheap Test Tools

Name	Phone	Country	Date
Fitzgerald	1-696-847-9724	Uzbekistan	Mar 22, 2009
Harrison	1-616-877-0863	Nigeria	Nov 12, 2007
Tiger	1-832-613-9835	Nepal	Aug 30, 2007
Raja	1-465-605-0566	Iran, Islamic Republic of	Dec 10, 2008
Gavin	1-442-189-9731	Estonia	Aug 5, 2008
Ivan	1-523-879-6151	Romania	Mar 9, 2009
Jonah	1-771-445-7800	Sweden	May 26, 2008
Sawyer	1-975-398-7400	Ecuador	Nov 14, 2008
Raymond	1-189-506-0741	Brunei Darussalam	Sep 26, 2008
Tate	1-797-795-5931	Estonia	Jan 19, 2008
Denton	1-907-919-7187	Poland	Jul 3, 2008
Steven	1-476-897-6663	Iran, Islamic Republic of	Oct 24, 2008
Lucian	1-906-318-5093	Belize	Sep 30, 2007
Bradley	1-382-169-9975	Saudi Arabia	Jul 12, 2007
Oren	1-444-188-6882	Brunei Darussalam	Aug 17, 2008
Yoshio	1-270-201-2305	Indonesia	Mar 21, 2009
Marvin	1-536-394-0384	Guadeloupe	Oct 6, 2008
Paul	1-305-227-1442	Moldova	Sep 27, 2007
Hu	1-487-531-1857	Christmas Island	Jan 16, 2009
Keegan	1-229-172-8024	Cayman Islands	Sep 9, 2008
Kareem	1-230-655-0948	Heard Island and Mcdonald Islands	Feb 21, 2008
Palmer	1-156-628-1401	Moldova	Mar 21, 2009
Perry	1-447-689-2022	Nepal	Dec 21, 2008
Preston	1-866-250-9555	Colombia	Mar 27, 2008
Tate	1-433-559-2830	Malawi	Jan 13, 2009
Cyrus	1-972-298-9756	Vanuatu	Mar 8, 2008
Benjamin	1-796-458-2926	Iceland	Jan 8, 2008
Phelan	1-666-961-2594	Singapore	Mar 3, 2008

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OTHERS?

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TEST EVALUATION

- **Beyond Compare**
  - www.scootersoftware.com
  - $30/single user, volume discounts
- **Exam Diff and DiffNow (online)**
  - www.prestosoft.com
  - Free and Pro versions
  - $35/single user, volume discounts
- **UltraCompare**
  - http://www.ultraedit.com
  - Lite and Pro Versions
  - Pro - $49.95
  - Windows, Mac, Linux

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TEST EVALUATION (2)

- **WinMerge**
  - http://winmerge.org
  - Open Source differencing and merging tool for Windows.
  - Compares both folders and files, presenting differences in a visual text format that is easy to understand and handle.
  - Very useful for determining what has changed between project versions, and then merging changes between versions.
  - Can be used as an external differencing/merging tool or as a standalone application.
- **WinDiff**
  - http://www.grigsoft.com/download-windiff.htm
  - Free, Windows only

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Free and Cheap Test Tools

TEST EVALUATION (3)

- **KDiff3**
  - http://kdiff3.sourceforge.net/
  - MS-Windows. Apple Mac OSX binary available
  - Free

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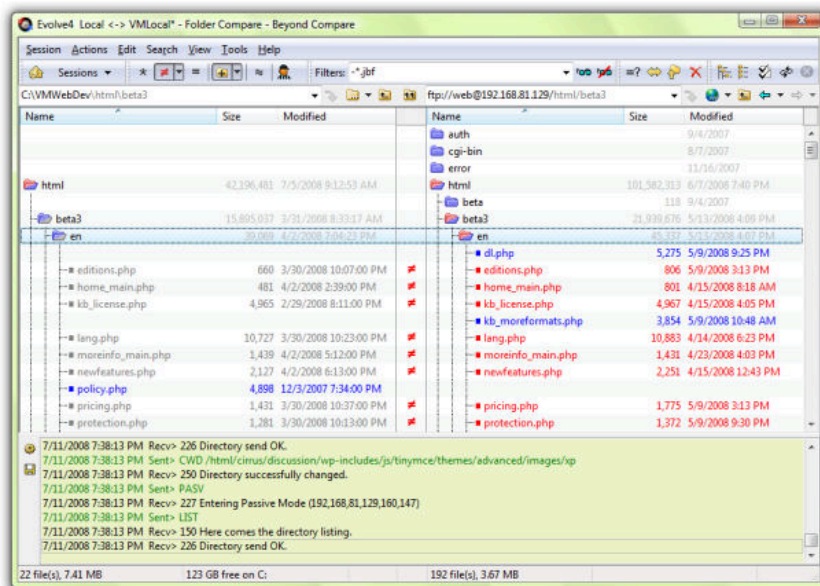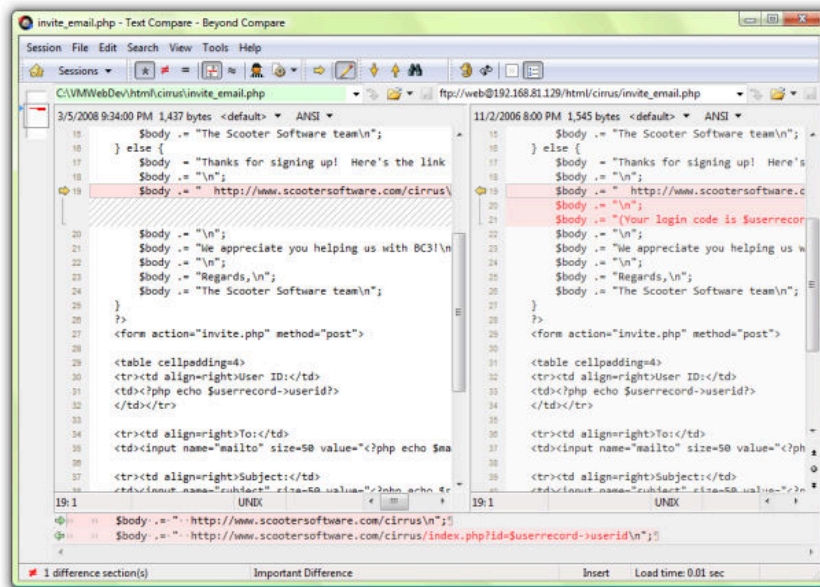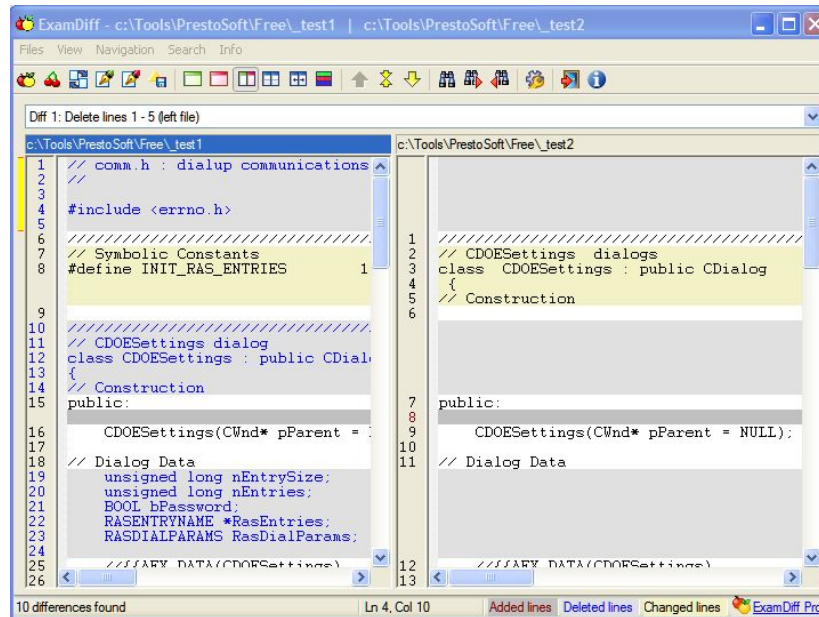
Free and Cheap Test Tools

ULTRACOMPARE

- **UltraCompare tracks changes and differences between files, directories, Word docs, zip archives;**

- **Supports both text compare and binary file compare of two or three files/folders at a time.**

- **Merge differences, find duplicates, edit files, and more.**

- **Integrates with UltraEdit or UEStudio!**

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ULTRACOMPARE

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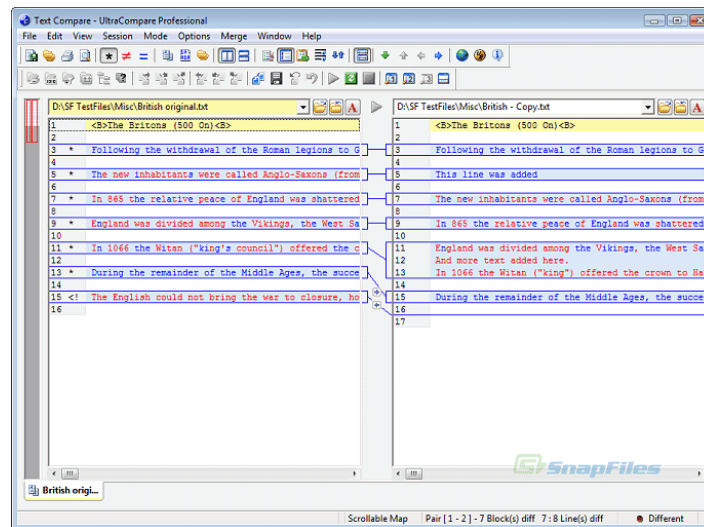
200
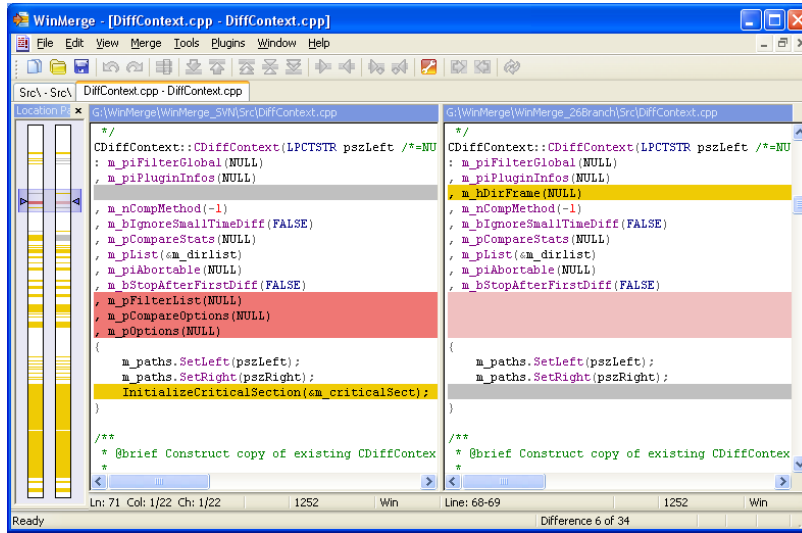
Free and Cheap Test Tools
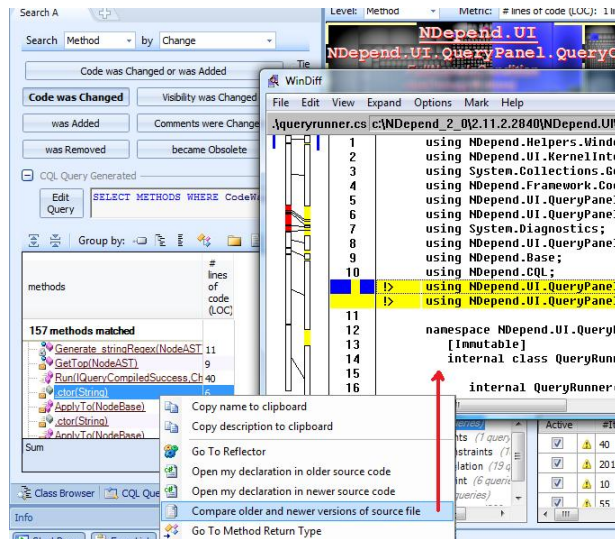
Free and Cheap Test Tools

KDIFF3

203
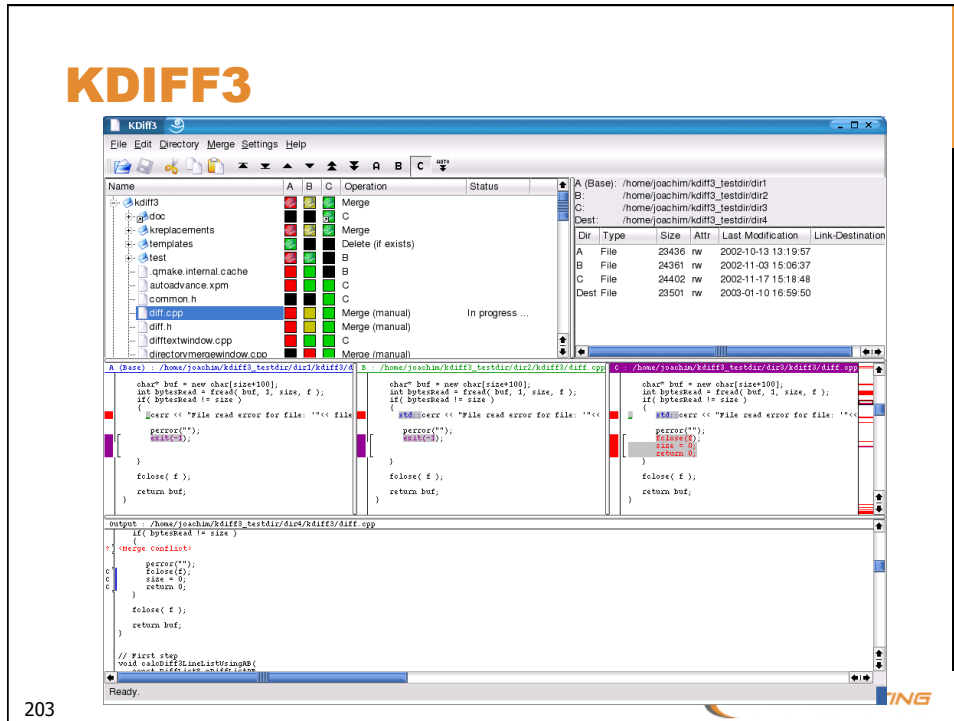
TEST EVALUATION (4)

- **Windows Media Encoder**
  - Free at www.microsoft.com
  - Captures screen video in wmv format
- **Hypercam**
  - $30/single user at www.hyperionics.com
  - Captures screen video in avi format
  - Volume discounts
- **Jing**
  - Free
  - www.techsmith.com
- **Skitch (Mac, Free)**
- **Screenr -** http://www.screenr.com/
- **Clarify -** http://www.clarify-it.com/

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TIMESNAPPER

- **Runs in the background of your computer, taking screenshots of your desktop every few seconds all week long.**
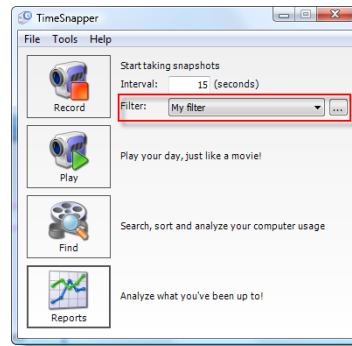
205

OTHERS?

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Free and Cheap Test Tools

DEFECT TRACKING

- **Bugzilla – free at www.bugzilla.org**
- **FlySpray – Free at www.flyspray.org**
- **Many more at:**
  - http://www.software-pointers.com/en-defecttracking-opensource-tools.html

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Free and Cheap Test Tools

MANTIS

- **MantisBT is a free popular web-based bugtracking system.**
- **It is written in the PHP scripting language and works with MySQL, MS SQL, and PostgreSQL databases and a webserver.**
- **http://www.mantisbt.org/**

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MANTIS (2)

- **MantisBT has been installed on Windows, Linux, Mac OS, OS/2, and others.**

- **Almost any web browser should be able to function as a client. It is released under the terms of the GNU General Public License (GPL).**

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Mantis

Logged in as: *prescience*   02-04-01 07:08 PST   mantis ▼ Switch

Main | View Bugs | Report Bug | Summary | Account | Manage | Edit News | Docs | Logout

[All Bugs] [Reported Bugs] [Assigned Bugs]

any ▼ any ▼ any ▼ Show: 50   Changed(hrs): 6   Hide Resolved: ☐
Filter

Viewing Bugs

ID	#	Category	Severity	Status	Updated	Summary
0000132		security	tweak	new	02-03	Something that lets you do something you're not suppose to do.
0000130		bugtracker	**block**	new	02-02	Coucou
0000133	1	bugtracker	**major**	new	02-03	testing
0000129	2	test	**major**	feedback	02-02	Catalyst crash Switch 1
0000131		bugtracker	**crash**	acknowledged	02-03	testing summary
0000064	3	bugtracker	feature	assigned	01-02	user defined fields / projects
0000066	3	bugtracker	feature	assigned	12-27	change to filter select lists on viewview bug pages
0000081	2	bugtracker	feature	assigned	01-22	Remember Previous Entry

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Free and Cheap Test Tools

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MANTIS MOBILE

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OTHERS

- **Redmine - http://www.redmine.org/**

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OTHERS?

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SOA

- **SoapUI**
  - http://www.soapui.org/
  - Free and Pro versions
- **PushToTest**

217
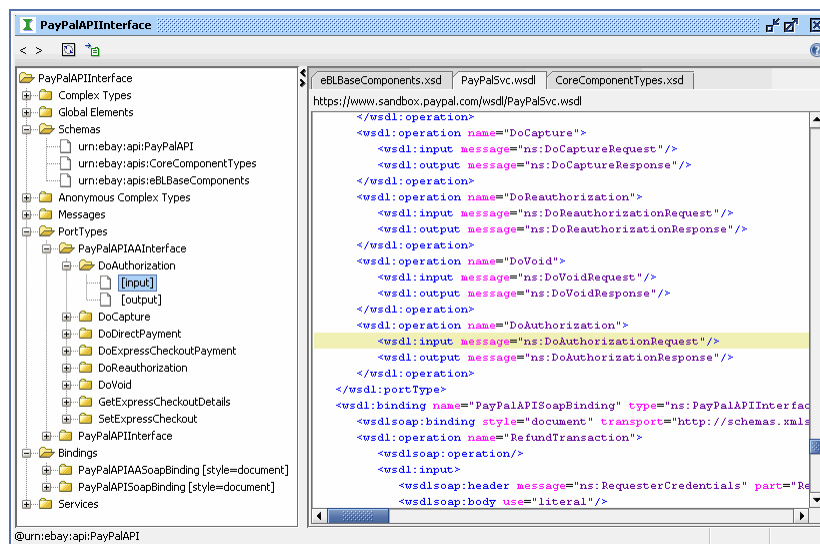
218

Free and Cheap Test Tools
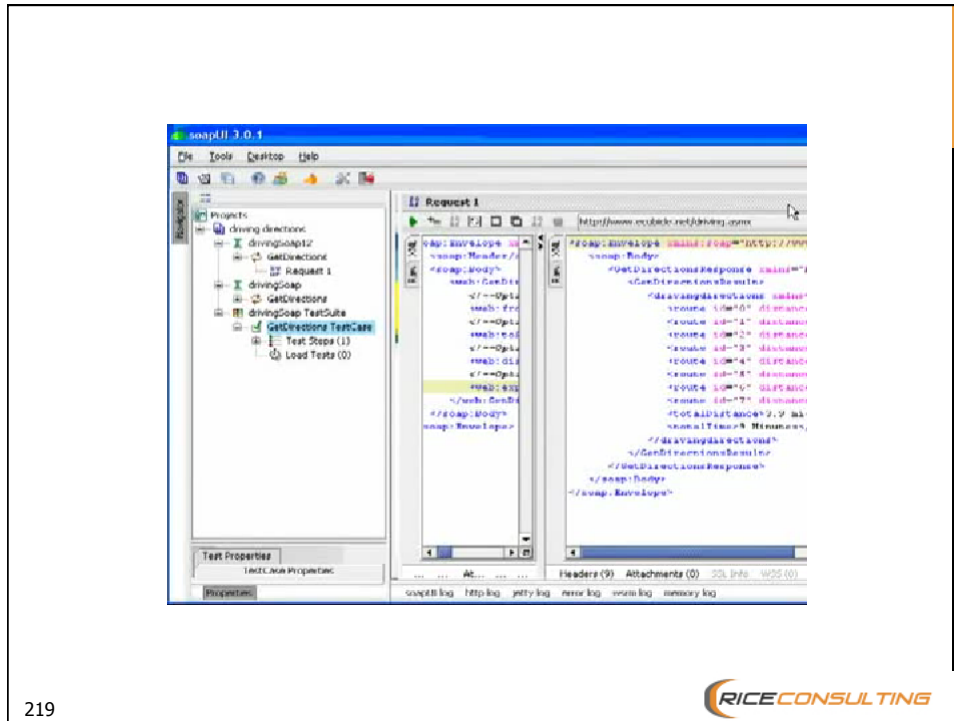
219

PUSHTOTEST

- **Tests Web, Rich Internet Applications (RIA, using Ajax, Flex, Flash,) Service Oriented Architecture (SOA,) and Business Process Management (BPM) applications.**

- **Installs on your desktop, runs tests in grid and cloud environments, and pinpoints root causes and offers mitigation.**

- **Test scripts can be in Selenium test, Sahi test, soapUI test suite, and unit test written in Java, Ruby, Python, and PHP.**

- **http://www.pushtotest.com/**

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FIDDLER

- **With Fiddler you can easily monitor what's going on under the hood of your HTTP traffic.**

- **You can set breakpoints for certain HTTP requests, you can have it mimic the web server, and it can just function as a proxy, while showing you what's happening.**

- **You can also construct requests in the tool and send that to mimic a client.**

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FIDDLER (2)

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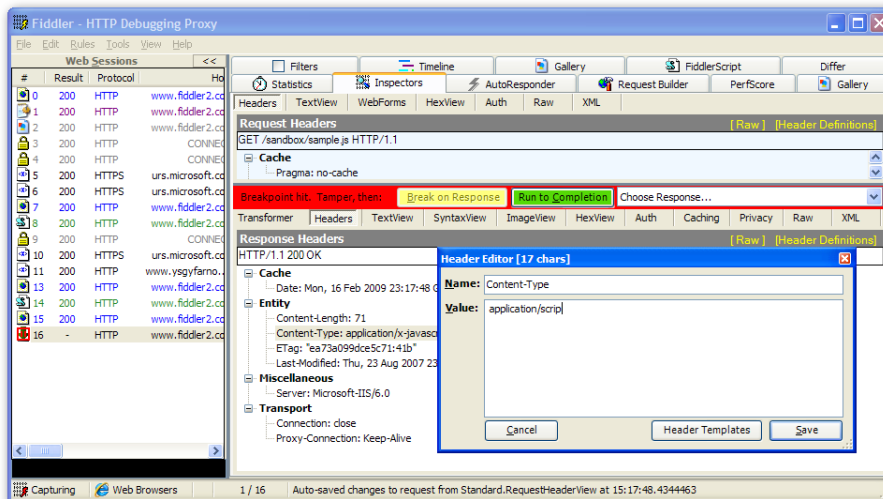
Free and Cheap Test Tools

FIDDLER (3)

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FIDDLER (4)

224

FIDDLER (5)
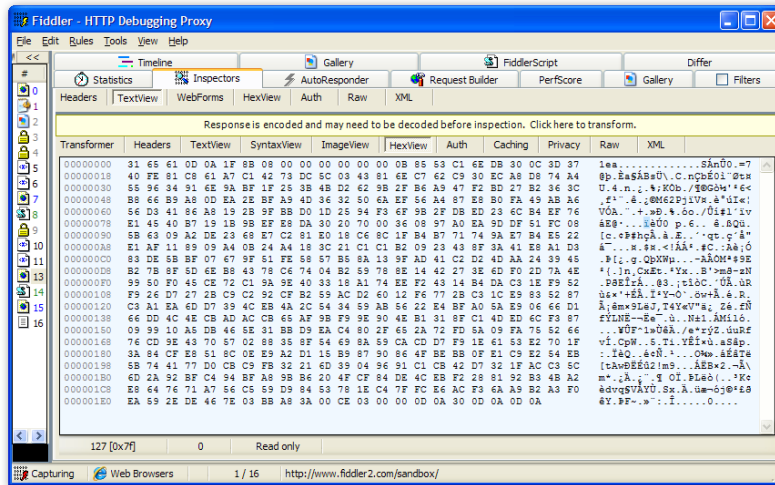
225

POSTER

- **Firefox add-on**
  - A developer tool for interacting with web services and other web resources that lets you make HTTP requests, set the entity body, and content type.
    - This allows you to interact with web services and inspect the results.
  - After you install it, just go to Tools->Poster to open the poster window. After that, try a GET or POST on your favorite web service or site.
  - https://addons.mozilla.org/en-US/firefox/addon/poster/

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POSTER (2)

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OTHERS?

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228
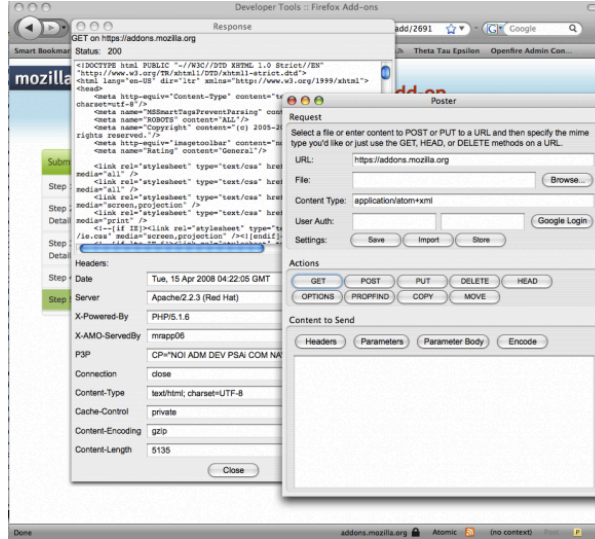
WEB TESTING

- **Link Checkers**
  - Link Tiger – www.linktiger.com
  - Xenu – www.xenu.com
  - X3C - http://validator.w3.org/checklink
  - Jspider - http://j-spider.sourceforge.net/
  - More at http://www.cryer.co.uk/resources/link_checkers.htm
- **Compliance Checkers**
  - http://www.thefreecountry.com/webmaster/htmlvalidators.shtml

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Free and Cheap Test Tools

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CANOO WEB TEST

- **Canoo WebTest is a free Open Source tool for automated testing of web applications in a very effective way.**
- **http://webtest.canoo.com**

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CANOO WEB TEST SCRIPTING

Simple Google Test in XML

```xml
<project default="test">
 <target name="test">

  <webtest
       name="check that WebTest is Google's top 'WebTest' result">
   <invoke url="http://www.google.com/ncr"
           description="Go to Google (in English)"/>
   <verifyTitle text="Google" />
   <setInputField name="q" value="WebTest" />
   <clickButton label="I'm Feeling Lucky" />
   <verifyTitle text="Canoo WebTest" />
  </webtest>

 </target>
</project>
```

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PEX AND MOLES

- **Isolation and White box Unit Testing for .NET**
  - Pex automatically generates test suites with high code coverage.
  - Allows the stubbing of .NET methods
  - http://research.microsoft.com/en-us/projects/pex
  - The Fakes Framework in Visual Studio 11 is the next generation of Moles & Stubs, and will eventually replace it.

	value
1	null
2	""
3	"\0"
4	":"

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CUITE (CODED UI TEST ENHANCED) FRAMEWORK

- **Thin layer developed on top of Microsoft Visual Studio Team Test's Coded UI Test engine.**
- **Helps reduce code (<10%), increases readability and maintainability, while also providing features for the automation engineer.**
- **http://cuite.codeplex.com/**

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GOOGLE JS TEST

- **Fast javascript unit testing framework that runs on the V8 engine, without needing to launch a full browser.**
- **http://code.google.com/p/google-js-test/**

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GOOGLE JS TEST EXAMPLE

```
RUN       ] UserInfoTest.formatsUSPhoneNumber
      OK ] UserInfoTest.formatsUSPhoneNumber
RUN       ] UserInfoTest.returnsLastNameFirst
er_info_test.js:32
pected: 'Doe, John'
tual:   'John Doe'

 FAILED  ] UserInfoTest.returnsLastNameFirst
RUN       ] UserInfoTest.understandsChineseNames
      OK ] UserInfoTest.understandsChineseNames
```

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REVIEWCLIPSE

- **A Free Continuous Code Review Plugin for Eclipse**
- **http://www.inso.tuwien.ac.at/projects/reviewclipse/**

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REVIEWCLIPSE SCREENSHOT

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STATIC ANALYSIS & CODE METRICS

- **FindBugs**
  - Open source program created by Bill Pugh and David Hovemeyer which looks for bugs in Java code.
  - It uses static analysis to identify hundreds of different potential types of errors in Java programs.
  - http://findbugs.sourceforge.net/

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COBERTURA

- **Cobertura is a free Java tool that calculates the percentage of code accessed by tests.**
  - It can be used to identify which parts of your Java program are lacking test coverage. It is based on jcoverage.

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SAMPLE COBERTURA OUTPUT

Packages

All
net.sourceforge.cobertura.ant
net.sourceforge.cobertura.check
net.sourceforge.cobertura.coveragedata
net.sourceforge.cobertura.instrument
net.sourceforge.cobertura.merge
net.sourceforge.cobertura.reporting
net.sourceforge.cobertura.reporting.html

All Packages

Classes

AntUtil *(88%)*
Archive *(100%)*
ArchiveUtil *(80%)*
BranchCoverageData *(N/A)*
CheckTask *(0%)*
ClassData *(N/A)*

Coverage Report – All Packages

Package	# Classes	Line Coverage		Branch Coverage		Complexity
All Packages	55	75%	1625/2179	64%	472/738	2.319
net.sourceforge.cobertura.ant	11	52%	170/330	43%	40/94	1.848
net.sourceforge.cobertura.check	3	0%	0/150	0%	0/76	2.429
net.sourceforge.cobertura.coveragedata	13	N/A	N/A	N/A	N/A	2.277
net.sourceforge.cobertura.instrument	10	90%	460/510	75%	123/164	1.854
net.sourceforge.cobertura.merge	1	86%	30/35	88%	14/16	5.5
net.sourceforge.cobertura.reporting	3	87%	116/134	80%	43/54	2.882
net.sourceforge.cobertura.reporting.html	4	91%	475/523	77%	156/202	4.444
net.sourceforge.cobertura.reporting.html.files	1	87%	39/45	62%	5/8	4.5
net.sourceforge.cobertura.reporting.xml	1	100%	155/155	95%	21/22	1.524
net.sourceforge.cobertura.util	9	60%	175/291	69%	70/102	2.892
someotherpackage	1	83%	5/6	N/A	N/A	1.2

Report generated by Cobertura 1.9 on 6/9/07 12:37 AM.

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COBERTURA FEATURES

- Can be executed from ant or from the command line.
- Instruments Java bytecode after it has been compiled.
- Can generate reports in HTML or XML.
- Shows the percentage of lines and branches covered for each class, each package, and for the overall project.

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COBERTURA FEATURES (2)

- Shows the McCabe cyclomatic code complexity of each class, and the average cyclomatic code complexity for each package, and for the overall product.
- Can sort HTML results by class name, percent of lines covered, percent of branches covered, etc. And can sort in ascending or descending order.
- http://cobertura.sourceforge.net/

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VIRTUAL TEST ENVIRONMENTS

- **http://www.virtualbox.org/**
  - Free, open source
  - runs on Windows, Linux, Macintosh and OpenSolaris hosts and supports a large number of guest operating systems including but not limited to Windows (NT 4.0, 2000, XP, Server 2003, Vista, Windows 7), DOS/Windows 3.x, Linux (2.4 and 2.6), Solaris and OpenSolaris, and OpenBSD.

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VIRTUAL TEST ENVIRONMENTS (2)

- **Windows Virtual PC**
  - Free
  - Windows only
  - www.microsoft.com

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QUALITY MANAGEMENT

- **SpagoWorld – Spagoworld.org**
  - **Spago4Q** - The free/open source platform to measure, analyze and monitor Quality of products, processes and services
  - **SpagoBI** – Open Source Business Intelligence suite
  - **Spagic** - The free/open source platform for the governance of middleware services and the development of SOA applications
  - **Spago** - The Java Enterprise Framework for the development of web and multichannel applications in SOA environments

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SPAGO4Q

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ONLINE COLLABORATION TOOLS

- **Web Presentations**
  - Anymeeting.com
  - www.Mikogo.com
  - www.joinme.com
  - www.vyew.com
- **Conference Calls**
  - TalkShoe – www.talkshoe.com
    - Great for distributed teams who want to talk for free.
    - Recordable and private

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SUMMARY

- **These tools can all be helpful in different ways.**
- **With test tools, you don't always get what you pay for, so regardless of the price do a decent evaluation.**
- **Free and cheap tools allow you to obtain and learn tools on your own.**
  - This helps in building your personal tool kit.

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RESOURCES

- **www.opensourcetesting.org**
- **www.openqa.org**
- **www.testertools.com**
- **http://www.toolsjournal.com/testing-lists/item/473-top-10-usability-testing-tools-for-your-website**
- **www.riceconsulting.com/cheaptools.htm**
  - I keep this page updated as I learn of new tools.
  - Let me know if you find a new one!

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BIO - RANDALL W. RICE

- Over 34 years experience in building and testing information systems in a variety of industries and technical environments
- ISTQB Certified Tester – Foundation level (CTFL), Advanced Level (CTAL) Full
- Director, American Software Testing Qualification Board (ASTQB)
- Chairperson, 1995 - 2000 QAI's annual software testing conference
- Co-author with William E. Perry, *Surviving the Top Ten Challenges of Software Testing* and *Testing Dirty Systems*
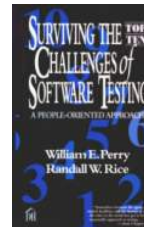- Principal Consultant and Trainer, Rice Consulting Services, Inc.

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CONTACT INFORMATION

Randall W. Rice, CTAL

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Oklahoma City, OK 73189

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Fax: 405-691-1441

Web site: www.riceconsulting.com

e-mail: rrice@riceconsulting.com

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