

# Robotframework 自动化测试介绍

@齐涛-道长

NJSD

南京软件开发者大会

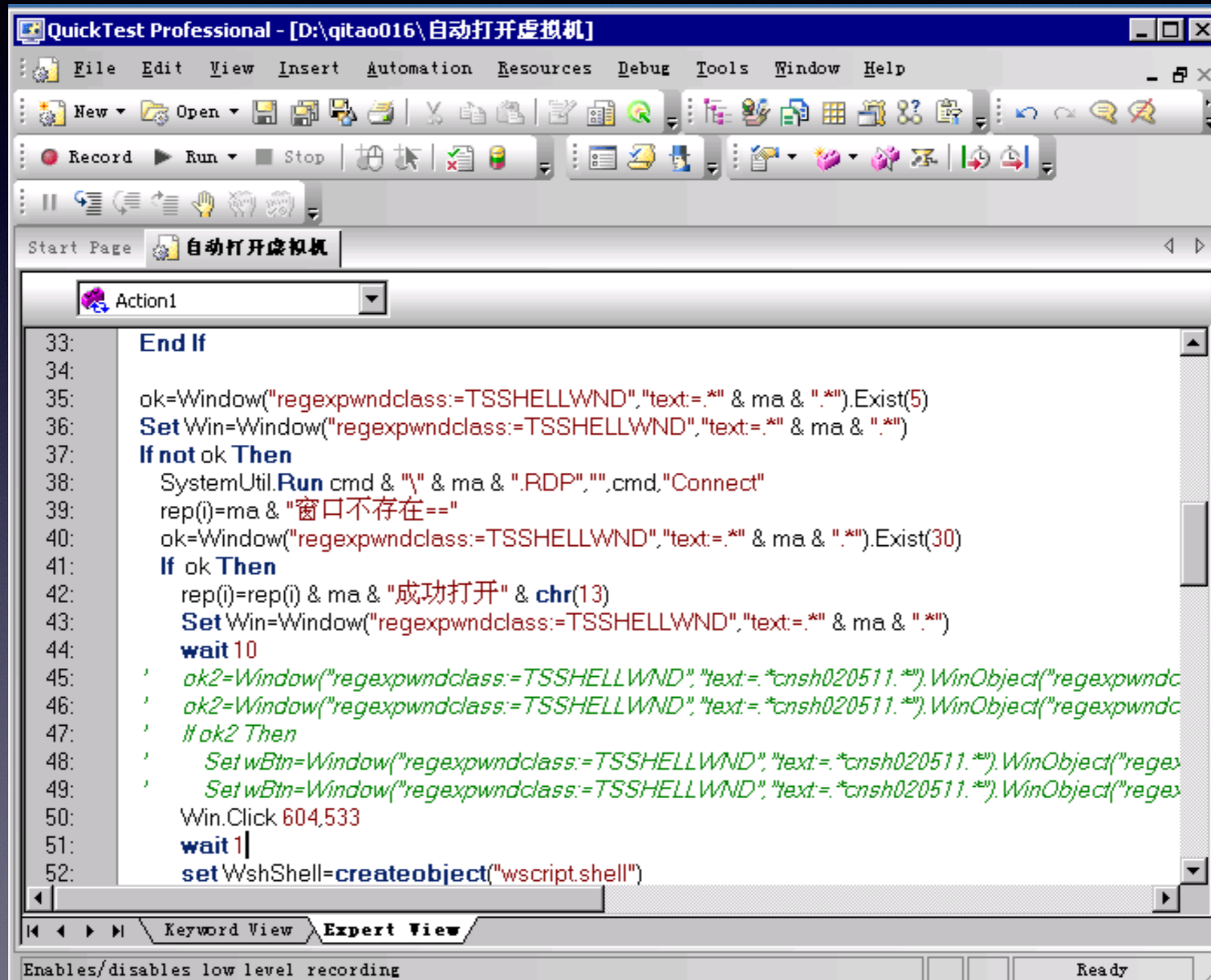
Software Developer Conference Nanjing

# 个人介绍



- @齐涛-道长
- 平安科技资深测试工程师
- 毕业于东北大学，市场营销专业；
- **Robotframework**自动化测试先行者。2011年开始接触**Robotframework**自动化测试，进行敏捷试点。2012年在敏捷项目中应用**Robotframework+selenium2library**进行自动化测试。
- 现在主要负责在公司内维护扩展**Robotframework**、**selenium**、**QTLibrary**等相关自动化测试库。

# QTP



# Selenium-Python

## Example 1:

- open a new Firefox browser
- load the Yahoo homepage
- search for “seleniumhq”
- close the browser

```
from selenium import webdriver
from selenium.webdriver.common.keys import Keys

browser = webdriver.Firefox()

browser.get('http://www.yahoo.com')
assert 'Yahoo!' in browser.title

elem = browser.find_element_by_name('p') # Find the search box
elem.send_keys('seleniumhq' + Keys.RETURN)

browser.quit()
```

# Selenium-Java

```
import junit.framework.Assert;
import junit.framework.TestCase;
import org.openqa.selenium.firefox.FirefoxDriver;
import org.openqa.selenium.htmlunit.HtmlUnitDriver;
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.WebElement;

public class TestGoogle extends TestCase{
    WebDriver driver;

    public void setUp() {
        driver = new FirefoxDriver();
        //driver = new HtmlUnitDriver();
    }

    public void tearDown() {
        driver.close();
    }

    public void testCheckGoogleTile() {
        driver.get("http://www.google.cn");
        WebElement element = driver.findElement(By.name("q"));
        element.sendKeys("test");
        element.submit();
        System.out.println("Title of this page: " + driver.getTitle());
        //Assert.assertEquals("test - Google 搜索", driver.getTitle());

        Assert.assertTrue(driver.getTitle().contains("Google"));

        WebElement res = driver.findElement(By.xpath("//div[@id='ires']/ol/li[1]/h3/a"));
        Assert.assertTrue(res.getText().contains("test"));
    }
}
```

# Robotframework

购买流程

Settings >>

1	打开浏览器	<code>\${url}</code>	
2	输入购买产品	<code>\${setpr}</code>	
3	输入购买数量	<code>\${setqn}</code>	
4	点击提交		
5	Wait Until Page Contains	<code>\${setpr}</code>	
6	<code>\${getpr}</code>	获取产品名称	
7	<code>\${getqn}</code>	获取数量	
8	验证是否一致	<code>\${setpr}</code>	<code>\${getpr}</code>
9	验证是否一致	<code>\${setqn}</code>	<code>\${getqn}</code>
10	关闭浏览器		

# 目录

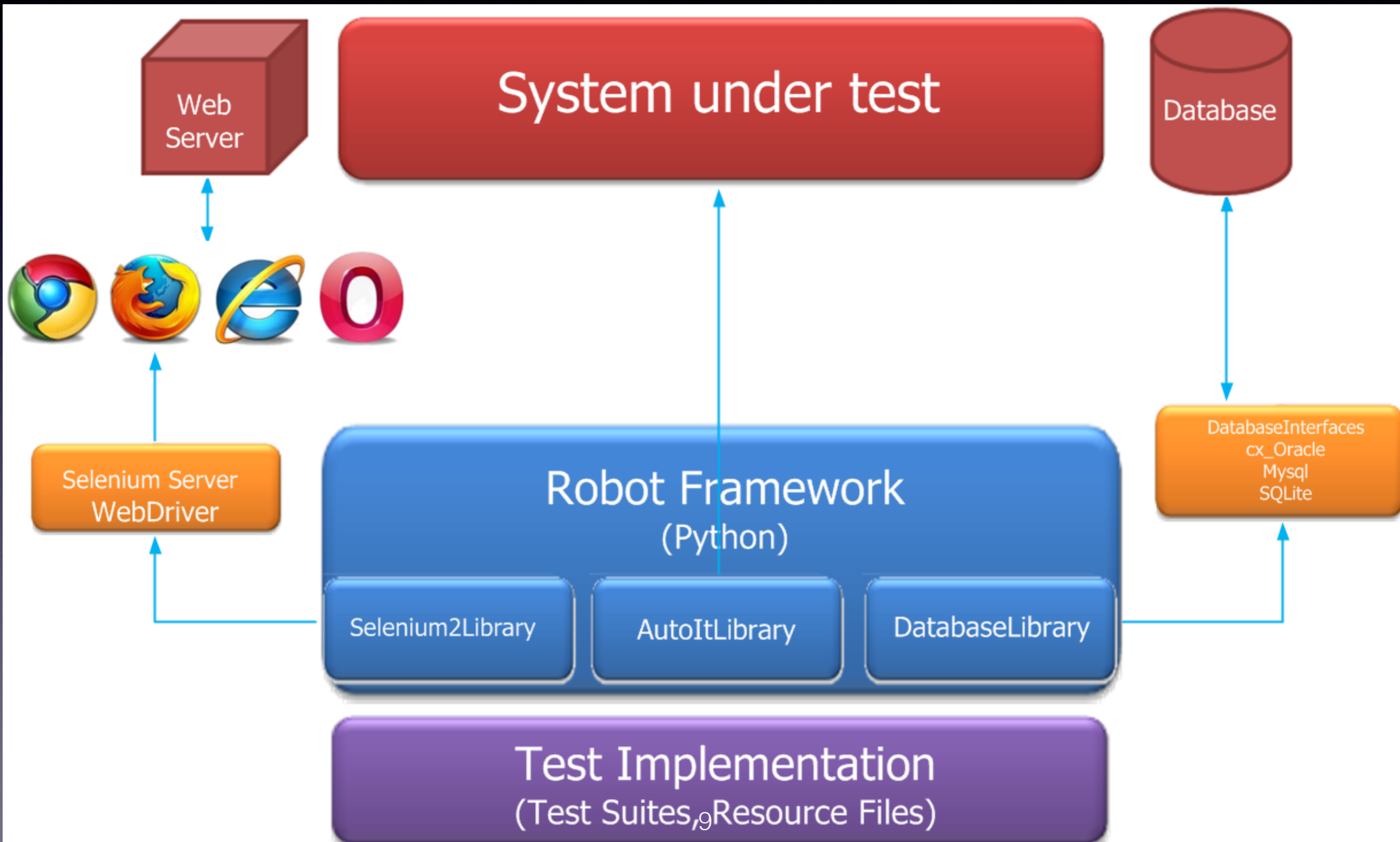
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- **测试案例 & 关键字**
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- **AutoltLibrary测试演示**
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- **其他及答疑**

# RobotFramework的特性

- 易于使用，采用表格式语法，统一测试用例格式
- 可以使用关键字驱动（**keyword-driven**）、数据驱动（**data-driven**）和行为驱动开发（**BDD**）完成。
- 重用性好，可以利用现有关键字来组合新关键字；
- 结果报告和日志采用**HTML**格式，易于阅读；
- 平台和应用无关联性；
- 模块结构支持使用不同的接口来测试你的应用；
- 易于扩展，提供了简单**API**，用户可以自定义的基于**Python**或者**Java**的测试库；
- 易于集成，提供了命令行接口和基于**XML**的输出文件；
- 功能全面，支持**WEB**测试（**Selenium**）、**Java GUI** 测试，启动线程、**Telnet**、**SSH**等；
- **RemoteLibrary**接口可以支持分布测试和使用其他编程语言实现测试库；
- 提供**tag**标签来分类和选择案例执行；
- 内置支持变量**variables**，支持不同的环境进行测试。
  
- 易于与版本管理集成；



# RF框架架构图



# 目录

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# 测试案例

购买流程			
<a href="#">Settings &gt;&gt;</a>			
1	打开浏览器	<code>\${url}</code>	
2	输入购买产品	<code>\${setpr}</code>	
3	输入购买数量	<code>\${setqn}</code>	
4	点击提交		
5	Wait Until Page Contains	<code>\${setpr}</code>	
6	<code>\${getpr}</code>	获取产品名称	
7	<code>\${getqn}</code>	获取数量	
8	验证是否一致	<code>\${setpr}</code>	<code>\${getpr}</code>
9	验证是否一致	<code>\${setqn}</code>	<code>\${getqn}</code>
10	关闭浏览器		

# 用户关键字

验证是否一致

Settings <<

Documentation

Arguments `${ver1} | ${ver2}`

Teardown

Timeout

Return Value `!${verifv}`

1	<code>\${verify}</code>	Should Be Equal	<code>\${ver1}</code>	<code>\${ver2}</code>
2		Variable assignment		
3				
4				
5				

# 测试日志

- 测试日志按树形组织
- 可自动提供错误步骤的屏幕截图

## Sample Test Log

Generated: 20110902 15:00:50 GMT +09:00  
11 seconds ago

## Test Statistics

Total Statistics				Total	Pass	Fail	Graph
Critical Tests	1	0	1	<div style="width: 100%; height: 10px; background-color: red;"></div>			
All Tests	1	0	1	<div style="width: 100%; height: 10px; background-color: red;"></div>			

Statistics by Tag				Total	Pass	Fail	Graph
No Tags				<div style="width: 0%; height: 10px; background-color: red;"></div>			

Statistics by Suite				Total	Pass	Fail	Graph
Sample	1	0	1	<div style="width: 100%; height: 10px; background-color: red;"></div>			
Sample.Suite1	1	0	1	<div style="width: 100%; height: 10px; background-color: red;"></div>			

## Test Execution Log

**TEST SUITE: Sample**  
Full Name: Sample  
Source: <d:\python27\scripts\sample>  
Start / End / Elapsed: 20110902 15:00:36.203 / 20110902 15:00:50.140 / 00:00:13.937  
Overall Status: **FAIL**  
Message: 1 critical test, 0 passed, 1 failed  
1 test total, 0 passed, 1 failed

**SETUP: SeleniumLibrary.Start Selenium Server**

**TEARDOWN: SeleniumLibrary.Stop Selenium Server**

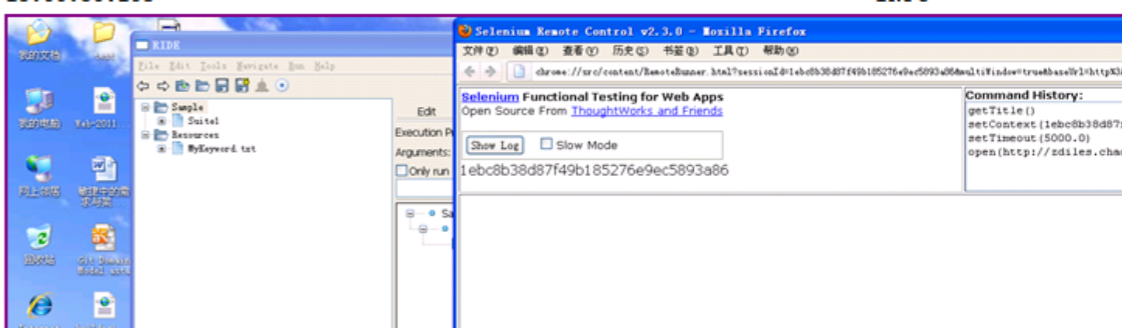
**TEST SUITE: Suite1**  
Full Name: Sample.Suite1

**TEST SUITE: Suite1**  
Full Name: Sample.Suite1  
Source: <d:\python27\scripts\sample\suite1.txt>  
Start / End / Elapsed: 20110902 15:00:36.515 / 20110902 15:00:50.108 / 00:00:13.593  
Overall Status: **FAIL**  
Message: 1 critical test, 0 passed, 1 failed  
1 test total, 0 passed, 1 failed

**TEST CASE: TestCase1**  
Full Name: Sample.Suite1.TestCase1  
Start / End / Elapsed: 20110902 15:00:36.530 / 20110902 15:00:50.108 / 00:00:13.578  
Status: **FAIL (critical)**  
Message: Timed out after 5000.0ms

**KEYWORD: mykeyword.打开浏览器**  
Start / End / Elapsed: 20110902 15:00:36.530 / 20110902 15:00:50.108 / 00:00:13.578

**KEYWORD: SeleniumLibrary.Open Browser <http://zdiles.chaosnet.org/>**  
Documentation: Opens a new browser instance to given URL.  
Start / End / Elapsed: 20110902 15:00:36.546 / 20110902 15:00:50.108 / 00:00:13.562  
15:00:50.108 INFO Opening browser 'firefox' to base url '<http://zdiles.chaosnet.org/>'  
15:00:50.108 INFO



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# Selenium2Library测试web

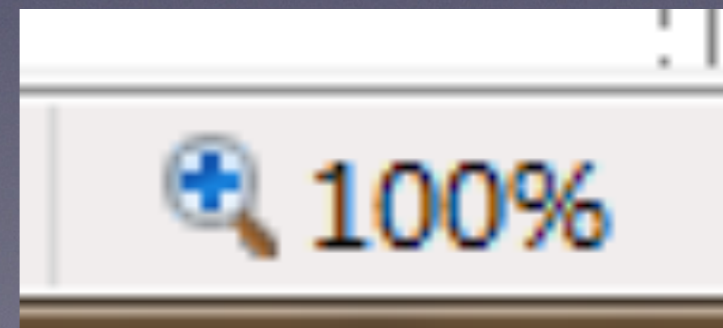
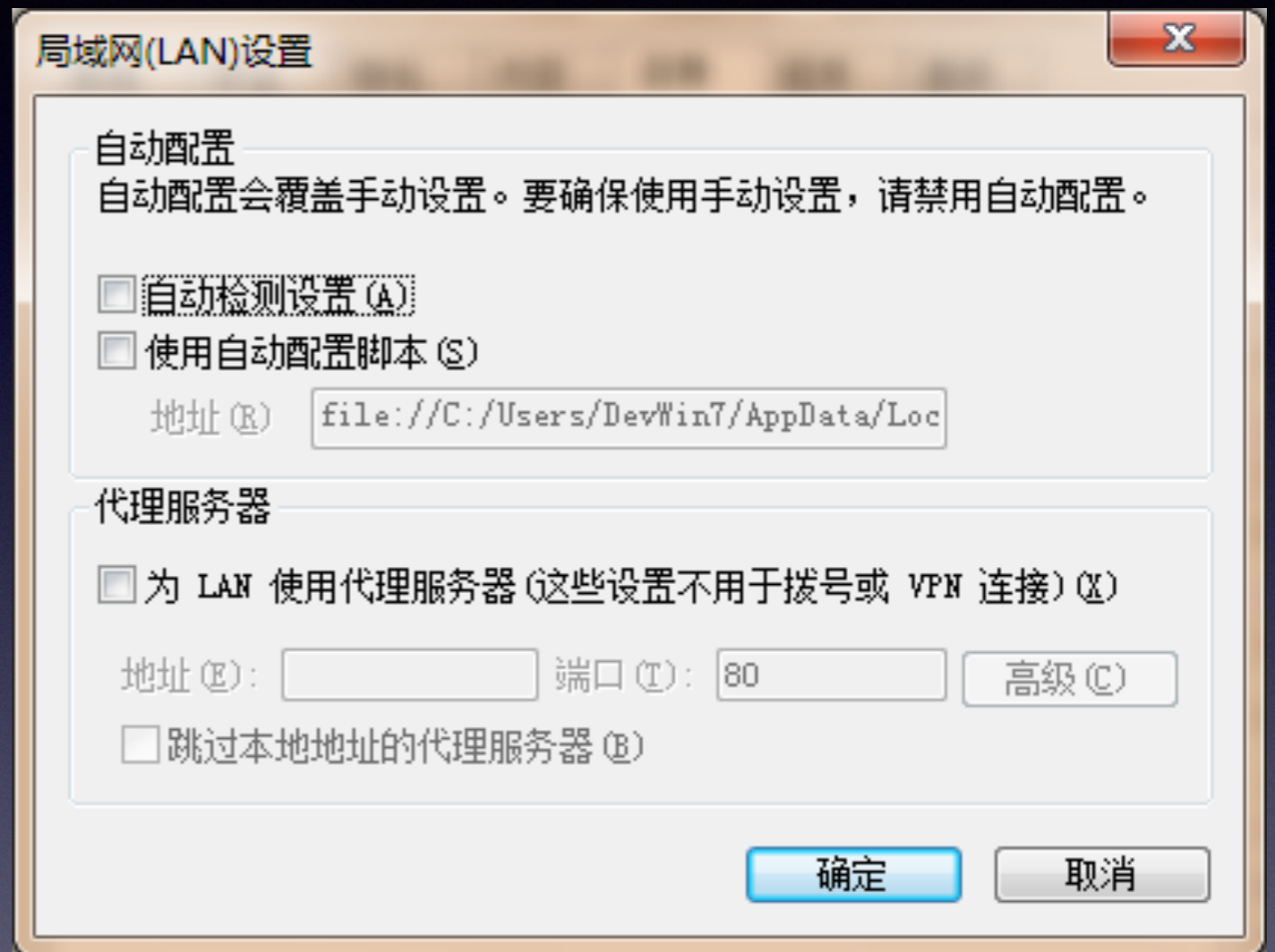
- Selenium2Library is a web testing library for Robot Framework that leverages the [Selenium 2 \(WebDriver\)](#) libraries from the [Selenium](#) project.
- It is modeled after (and forked from) the [SeleniumLibrary](#) library, but re-implemented to use Selenium 2 and WebDriver technologies.

# Selenium2Library测试web

- 支持的浏览器：
- | firefox 或 ff | FireFox |
- | internetexplorer 或 ie | Internet Explorer |
- | googlechrome 或gc 或 chrome | Google Chrome |
- | opera | Opera |
- | phantomjs | PhantomJS |
- | htmlunit | HTMLUnit |
- | htmlunitwithjs | HTMLUnit with Javascript support |
- | android | Android |
- | iphone | Iphone |



# IE设置



# Selenium2Library测试web

- 常用关键字：
  - Open Browser    Close Browser    Close All Browser
  - Log Source
  - Input Text
  - Click Button    Click Element    Click Link
  - Confirm Action
  - Capture Page Screenshot
  - Assign Id To Element
  - Execute Javascript
  - Select From List
  - **Select Frame**
  - **Select Window**
  - Wait Until Page Contains
  - Wait Until Keyword Succeeds (BuiltIn)
  - Run Keyword XXX (BuiltIn)

# 定位元素

- **Locator**
  - 可以id或name来用定位界面元素
  - 也可以使用XPath或Dom，但是，必须用XPath=或Dom=来开头

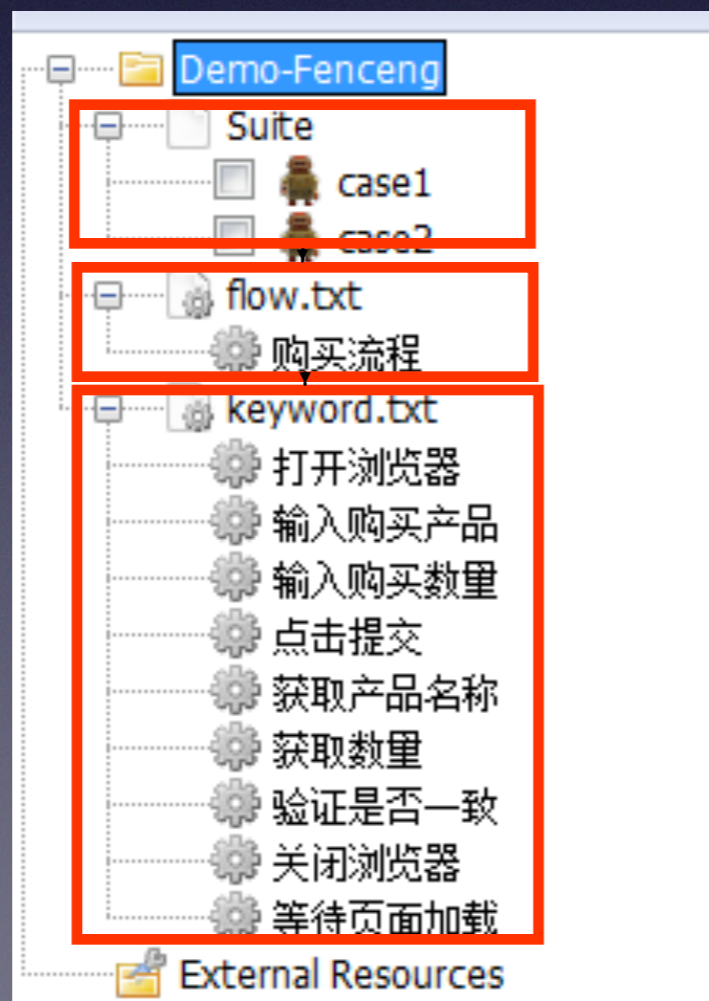
Strategy	Example	Description
identifier	Click Element   identifier=my_element	Matches by @id or @name attribute
id	Click Element   id=my_element	Matches by @id attribute
name	Click Element   name=my_element	Matches by @name attribute
xpath	Click Element   xpath=//div[@id='my_element']	Matches with arbitrary XPath expression
dom	Click Element   dom=document.images[56]	Matches with arbitrary DOM express
link	Click Element   link=My Link	Matches anchor elements by their link text
css	Click Element   css=div.my_class	Matches by CSS selector
tag	Click Element   tag=div	Matches by HTML tag name

# Selenium2Library演示

- demo演示

# 写好自动化测试用例原则

- 要做到流程和数据的分离
- 通过不断抽象，消除冗余
- 测试用例应尽量简单易读，避免复杂逻辑
- 建立测试用例分层架构，并坚守



**Suite**  
Source: D:\Python27\Scripts\demo-fenceng\suite.txt

Settings >>

Import	Name / Path	Arguments	Comment
Resource	flow.txt		

**Flow**  
Source: D:\Python27\Scripts\demo-fenceng\flow.txt

Settings >>

Import	Name / Path	Arguments	Comment
Resource	keyword.txt		

# 测试用例层次架构 (实例)

测试用例 =  
测试流程模板 +  
测试数据

测试流程模板 =  
测试流程构件的排列

测试流程构件 =  
测试流程步骤的排列

测试流程步骤 =  
界面交互细节

新保			
Settings >>			
1	新保流程	110000	110100
2	新保流程	310000	310100

新保流程			
Settings >>			
1	打开页面	\${province-code}	\${city-code}
2	基本信息页-北京	\${mobile}	\${email}
3	NewCarBasicInfo	\${province-code}	\${city-code}

基本信息页-北京			
Settings >>			
1	新车		
2	手机	\${mobile}	
3	电邮	\${email}	
4	生效日期	\${valid-date}	

手机			
Settings >>			
1	INPUT TEXT	pre_insurantMobilePhone	\${arg1}

Call Selenium  
Library

# 分层总结

- 越靠近顶层，越接近手工测试案例
- 越靠近底层，越接近测试脚本
  
- 像写代码一样写案例，像写案例一样写代码。
  
- **RF**的关键词驱动：函数式关键字
- **Keyword | arg1...argN** (做操作)
- **Variable(s)= | Keyword | arg1...argN** (返回值)

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- 其他及答疑



# AutoltLibrary介绍及演示

- AutoltLibrary is a Python keyword library that extends [Robot Framework](#) by providing keywords based on the COM interface to [Autolt](#), a freeware tool for automating the Windows GUI.

# AutoltLibrary介绍及演示

- 先安装Python Windows Extension(pywin32-216.win32-py2.7.exe) (需要本机管理员权限)
- 再安装AutoltLibrary-1.1，解压zip到任意不带空格目录，然后在目录下执行
  - Python setup.py install
- AutoltLibrary-1.1
  - 下载路径: <http://code.google.com/p/robotframework-autoitlibrary/>
- pywin32-217.win32-py2.7.exe
  - 下载路径: <http://sourceforge.net/projects/pywin32/files/pywin32/>

# AutoltLibrary介绍及演示

- 演示
  - 计算器
  - 对话框
  - 上传
  - 下载

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# DatabaseLibrary介绍

- **Database Library contains utilities meant for Robot Framework's usage. This can allow you to query your database after an action has been made to verify the results. This is compatible\* with any Database API Specification 2.0 module.**

# 安装-DatabaseLibrary

- **cx\_Oracle-5.1.2-11g.win32-py2.7.msi** (目前最新5.1.2, 注意要和你本地的oracle客户端版本一致)
  - 下载路径: <http://sourceforge.net/projects/cx-oracle/files/>
- **DatabaseLibrary**
  - 下载路径: <http://franz-see.github.io/Robotframework-Database-Library/>

# DatabaseLibrary介绍

- 支持的数据库：
  - IBM DB2
  - Firebird (and Interbase)
  - Informix
  - Ingres
  - MySQL
  - Oracle
  - PostgreSQL
  - SAP DB (also known as "MaxDB")
  - Microsoft SQL Server
  - Microsoft Access
  - Sybase
  - SQLite
  - .....
  - <https://wiki.python.org/moin/DatabaseInterfaces>

# DatabaseLibrary演示

- 演示
  - Oracle
  - sqlite3



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# Appium 自动化测试

- 需要安装
- appium (android环境, xcode-command-line)
- Appium-Python-Client
- robotframework-appiumlibrary

# appium-doctor

## Running iOS Checks

- ✓ Xcode is installed at /Applications/Xcode.app/Contents/Developer
- ✓ Xcode Command Line Tools are installed.
- ✓ DevToolsSecurity is enabled.
- ✓ The Authorization DB is set up properly.
- ✓ Node binary found at /usr/local/bin/node
- ✓ iOS Checks were successful.

## Running Android Checks

- ✓ ANDROID\_HOME is set to "/Users/qitao/Desktop/mobile/android/adt-bundle-mac-x86\_64-20140321/sdk"
  - ✓ JAVA\_HOME is set to "/System/Library/Frameworks/JavaVM.framework/Home."
  - ✓ ADB exists at /Users/qitao/Desktop/mobile/android/adt-bundle-mac-x86\_64-20140321/sdk/platform-tools/adb
  - ✓ Android exists at /Users/qitao/Desktop/mobile/android/adt-bundle-mac-x86\_64-20140321/sdk/tools/android
  - ✓ Emulator exists at /Users/qitao/Desktop/mobile/android/adt-bundle-mac-x86\_64-20140321/sdk/tools/emulator
  - ✓ Android Checks were successful.
- 
- ✓ All Checks were successful

# appium演示

- iOS演示
- Android演示

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# RF和敏捷测试

Jenkins

搜索

退出

Jenkins

web\_

ENABLE AUTO REFRESH

- 返回
- 状态
- 变更集
- 工作区
- 立即构建
- 删除 Project
- 配置
- Job Config History
- Robot Results
- Open Latest Robot log.html

## Project web\_

- 工作区
- 最近变更集

### Latest Robot Results:

In build number #103

[Open log.html](#)

- Pass ratio (Critical tests): 100%
- Pass ratio (All tests): 100%
- Tests passed (Critical tests): 15/15
- Tests passed (All tests): 15/15

### 永久连接

- [Last build\(#103\), 22 小时前](#)
- [Last stable build\(#103\), 22 小时前](#)
- [Last successful build\(#103\), 22 小时前](#)
- [Last failed build\(#101\), 2 days 23 小时前](#)
- [Last unsuccessful build\(#101\), 2 days 23 小时前](#)

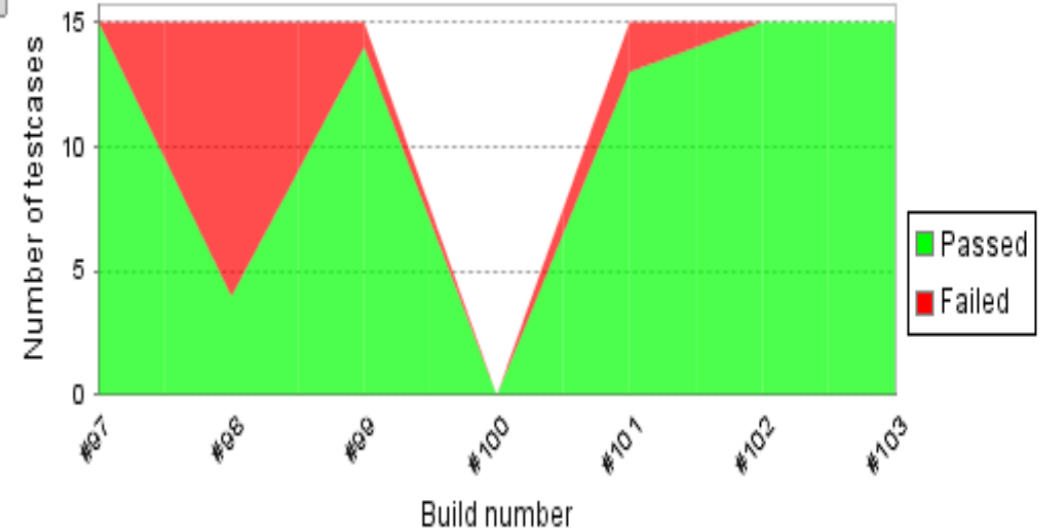
### Build History (趋势图)

Build Number	Time
#103	2013-12-15 10:49:58
#102	2013-12-14 11:45:55
#101	2013-12-13 10:12:56
#100	2013-12-12 10:13:03
#99	2013-12-11 10:00:55
#98	2013-12-10 10:22:27
#97	2013-12-9 10:00:53

RSS 全部 RSS 失败

禁用项目

### Robot Framework Tests Trend (all tests)



添加说明

# RF和敏捷测试

在必要的时候并发构建

Restrict where this project can be run

Label Expression



## 高级项目选项

高级...

## 源码管理

Base ClearCase

CVS

ClearCase UCM baseline

None

Subversion

Modules

Repository URL

Local module directory (optional)

Add more locations...

Check-out Strategy

Use 'svn update' whenever possible, making the build faster. But this causes the artifacts from the previous build to remain when a new build starts.

源码库浏览器

高级...

# RF和敏捷测试

## 构建

### Execute Windows batch command

```
命令 echo on
java -version
python --version
pybot.bat --name [redacted] --test * -v url:http://[redacted] -i run -d .\Result test\[redacted]\[redacted].txt
```

See [the list of available environment variables](#)

删除

增加构建步骤 ▾

## 构建后操作

### Publish Robot Framework test results

Directory of Robot output

Path to directory containing robot xml and html files (relative to build workspace)

Log/Report link

Name of log or report file to be linked on jobs front page

高级...

Thresholds for build result

Use thresholds for critical tests only



# RF和敏捷测试

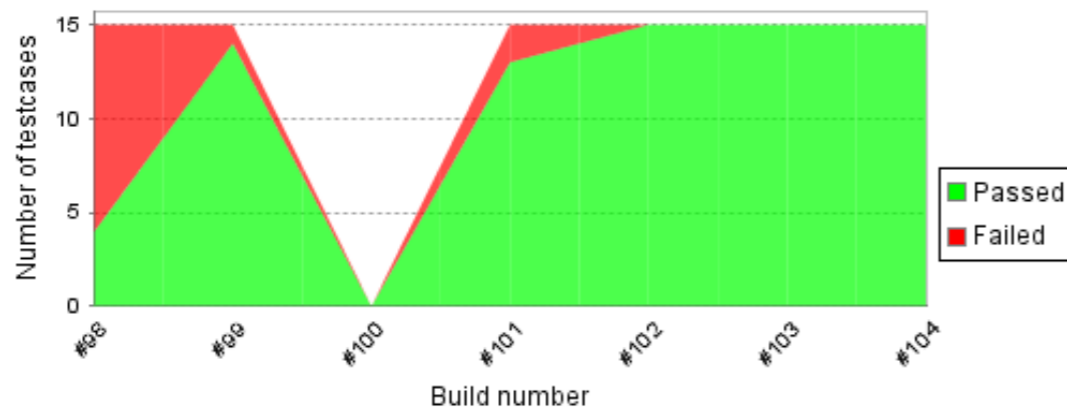
## Robot Framework test results

15 tests in total ( $\pm 0$ ), 15 critical

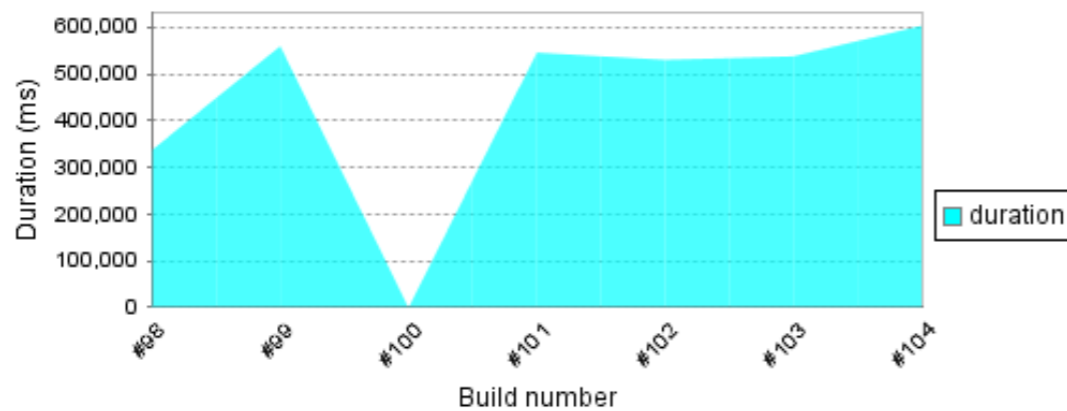
[Original report files](#)

Executed at 20131216 11:11:22.636  
Tests took 602937ms (+65449)

### Pass/fail trend



### Duration trend



### All test suites

Name	Failed tests (diff)	Total tests (diff)	Duration ms (diff)
<a href="#">CFS-CS</a>	0 ( $\pm 0$ )	15 ( $\pm 0$ )	602937 (+65449)

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# 其他

- **RF测试库不仅仅是前面那些，还有以下：**
  - **QTLibrary**（我自己写的库，功能就是随机生成汉字姓名、身份证号等等，<https://github.com/qitaos/robotframework-QTLibrary>)
  - **HTTP test library using Requests** <https://github.com/bulkan/robotframework-requests>
  - **HTTP test library using livetest** <https://github.com/peritus/robotframework-httplibrary>
  - **SshLibrary** <http://code.google.com/p/robotframework-sshlibrary/>
  - **mabot** <http://code.google.com/p/robotframework-mabot/> 用于手工执行robotframework案例，最新0.10版本。
  - 还有很多，不一一列举

# requests接口自动化

- **requests**
- **robotframework-requests**

# Q&A

# 联系方式

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