实验五 2　Webstress 性能自动测试
实验报告

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目录

1 实验目的

学习 Webstress 软件测试工具，及 Test Manager 测试管理工具，针对所选系统实现情况，编写测试计划、设计测试用例，掌握软件自动测试方法。

2 实验要求

1. 下载、安装 Webstress 工具软件，学习软件使用；
2. 运用 Webstress 工具软件进行性能自动测试；

3 实验内容及步骤

3.1 Webstress 工具软件对中国矿业大学网站进行性能自动测试

Webserver Stress Tool 能够模拟大量用户通过 HTTP 协议访问网站。根据用户的设置，模拟用户不仅可以下载 HTML 网页文件，也可以下载图片、动画等，跟普通用户进入网站的行为一模一样。

Webserver Stress Tool 提供一些报告和日志来显示对网站服务器和网络平台有价值的数据。

报告包括：

点击时间——一个用户完成网页加载的时间。这是一个从点击链接到用户看到整个网页所经历的时间。

域名解析时间——用户用客户端系统的域名解析服务器解析一个 URL 的域名所用的时间。

连接时间——与服务器建立一个连接所用的时间。

第一字节时间(FTB)——从初始化一个请求到接收到属鸡的第一个字节所花费的时间。

请求时间(TLB)——网站服务器所拥有的带宽。

用户带宽——每个有效用户所拥有的平均带宽。

发送请求——一段时间内发送给服务器的请求。

接收请求——一段时间内从服务器接受的请求。

开启请求——给定时间时开启的请求数量。

出错率——每个时间段、每个用户、每个 URL 的请求失败数量。

Webserver Stress Tool 的功能从左边一栏可以看到，分为三大项，为别是建立测试、设置、测试结果，用分为 6 小项，分别是测试类型、网址、浏览器设置、选项、日志文件、图形。

3.1.1 选择测试类型（Test Type）

选择测试类型和用户数量。

当第一次打开 Webserver Stress Tool 时，会自动到选择用户和测试类型窗口，或者点击左边的工具栏选择 Test Type 进入此窗口。查看 User Simulation 项目，Number of Users 设置模拟访问者的人数，Click Delay 设置指定的时间间隔。

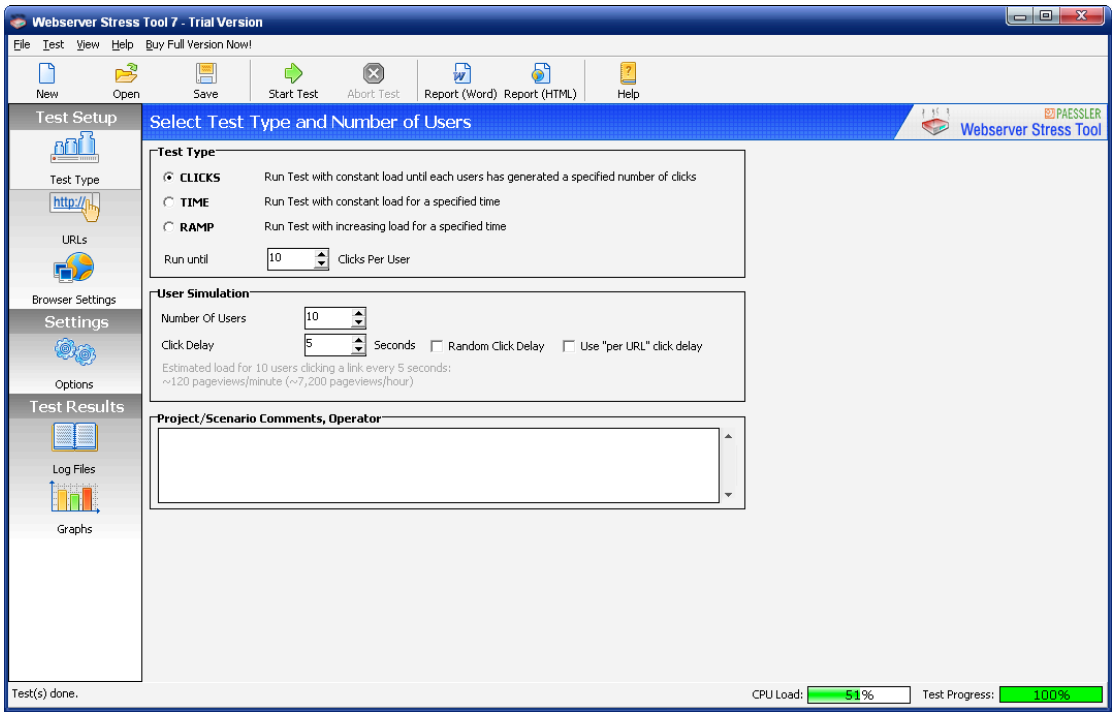

图 3-1 选择测试类型

Webserver Stress Tool 可以提供三种主要的测试类型：

点击测试：当每个模拟的用户完成了设定的点击数后就完成了。点击测试是

测试一系列网址的不二选择。

时间测试：此项测试运行指定的时间。时间测试通常被用作“烧机测试”。比如将服务器保持满载 10 个小时。

梯度测试：此项测试也运行制定的时间，但是会从 1 个用户增长到指定数目的用户。梯度测试是找出你服务器的上限的好方法。用户模拟用户数量可以输入 1 到 10000，但是是否能够成功模拟最大模拟用户数量取决于客户端运行 Webserver Stress Tool 的机器的性能。

3.1.2 选取 URL 选项

新增要测试的网站网址。

点击左边的工具栏选择 URLs 进入此窗口。

Number of URLs 中填写预测网站服务器的数量，输入要进行测试的网址，网址，点击延时设为 6。

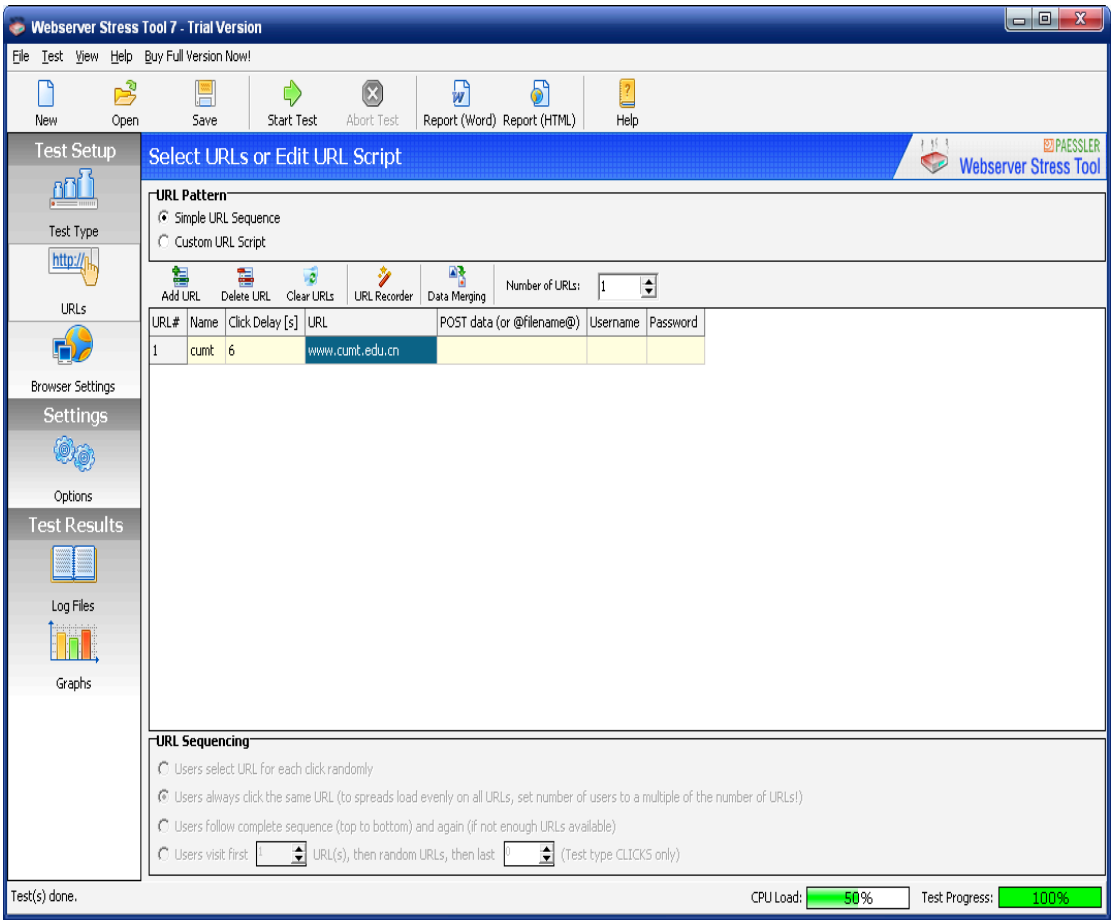

图 3-2 选取 URL 选项

3.1.3 模拟浏览器设置

点击左侧 Brower Settings 按钮，进入模拟浏览器设置，在 Use Proxy 选项中设置代理服务器 IP 及端口，在 Use Proxy User 选项中设置代理服务器的用户名和密码，在 Use Agent 下拉雷彪中选择浏览器模拟测试。Recursive browsing 项目中勾选 Download Image URLs 代表下载图片，勾选 Download EMBED,OBJECT and FLASH 表示下载嵌入对象。

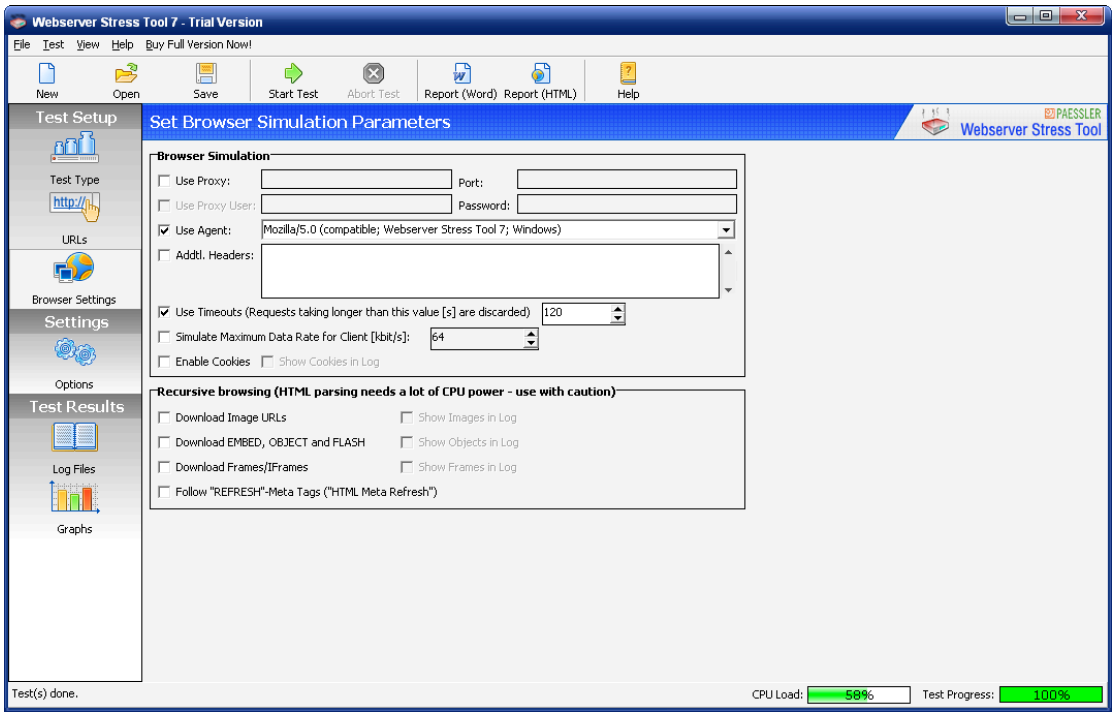

图 3-3 模拟浏览器的设置

3.1.4 设置浏览器选项

在左侧点击 Options 按钮，如希望定时执行测试操作，则在其中的 Timer 项目中勾选 Start Test At 复选框，在其右侧设置预定的日期和世界，设置日志记录的内容。

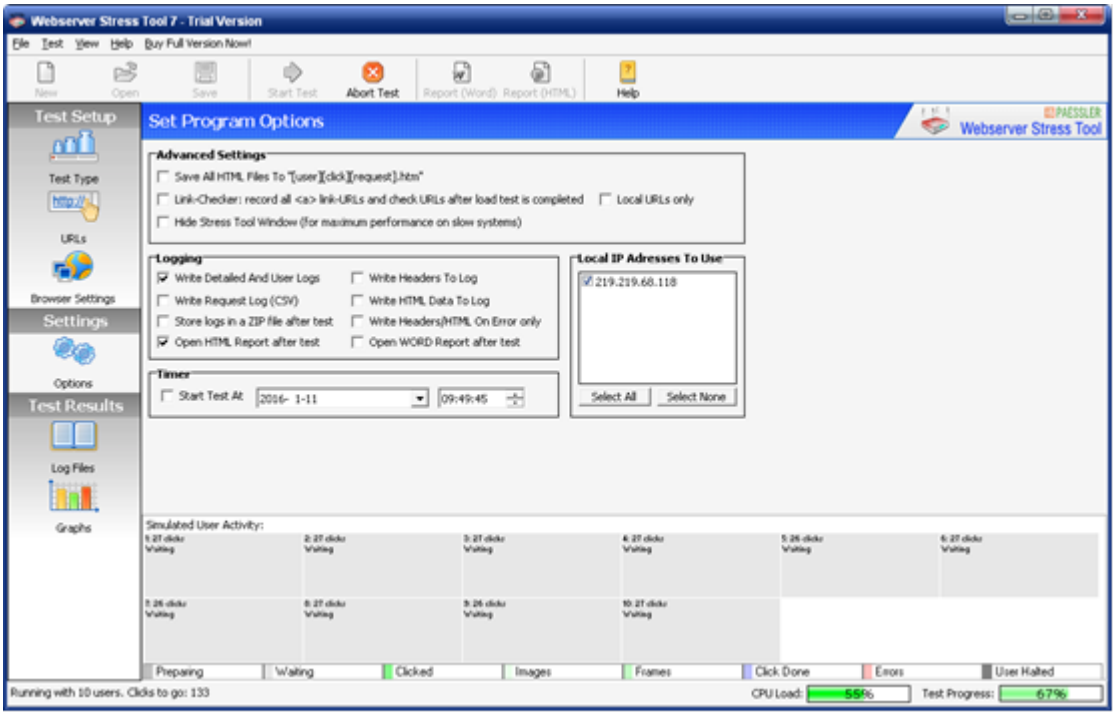

图 3-4 设置浏览器选项

3.1.5 开始测试

点击上侧工具栏上的 Start Test，开始进行指定网站服务器的压力测试。

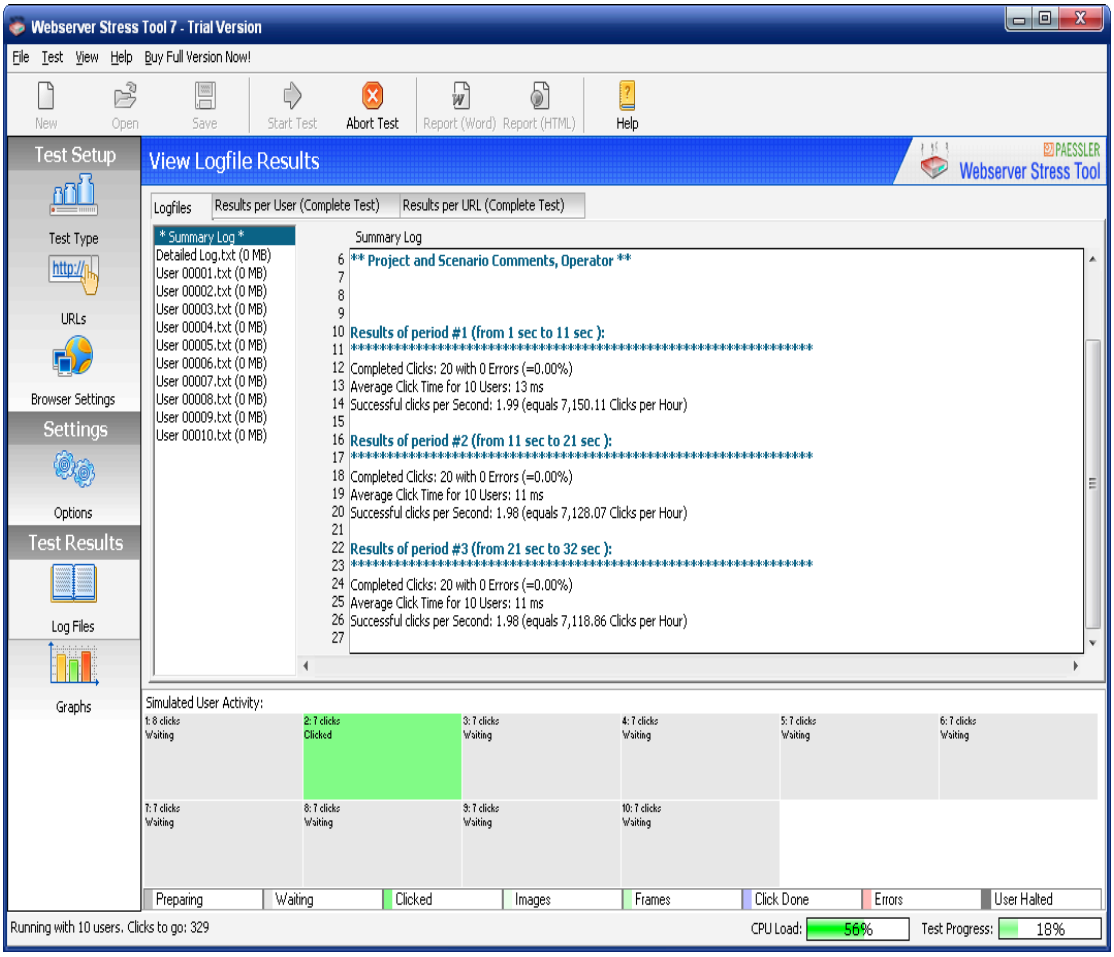

图 3-5 开始测试

3.2 分析结果

点击 Start Test 后直接出现下列三个选项卡：

（1）Logfiles：

** Test Logfile by Webserver Stress Tool 7.0.3.187 Trial Version **
?1998-2005 Paessler GmbH, http://www.paessler.com

Test run on 2016-1-11 上午 09:55:16

** Project and Scenario Comments, Operator **

Results of period #1 (from 1 sec to 11 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 13 ms

Successful clicks per Second: 1.99 (equals 7,150.11 Clicks per Hour)

Results of period #2 (from 11 sec to 21 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 11 ms
Successful clicks per Second: 1.98 (equals 7,128.07 Clicks per Hour)

Results of period #3 (from 21 sec to 32 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 11 ms
Successful clicks per Second: 1.98 (equals 7,118.86 Clicks per Hour)

Results of period #4 (from 32 sec to 42 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 16 ms
Successful clicks per Second: 1.96 (equals 7,070.18 Clicks per Hour)

Results of period #5 (from 42 sec to 52 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 34 ms
Successful clicks per Second: 1.97 (equals 7,072.95 Clicks per Hour)

Results of period #6 (from 52 sec to 62 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 130 ms
Successful clicks per Second: 1.98 (equals 7,136.10 Clicks per Hour)

Results of period #7 (from 62 sec to 72 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 19 ms
Successful clicks per Second: 1.98 (equals 7,134.76 Clicks per Hour)

Results of period #8 (from 72 sec to 82 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 20 ms
Successful clicks per Second: 1.98 (equals 7,136.76 Clicks per Hour)

Results of period #9 (from 82 sec to 92 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 11 ms
Successful clicks per Second: 1.98 (equals 7,134.67 Clicks per Hour)

Results of period #10 (from 92 sec to 102 sec):
****
Completed Clicks: 18 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 12 ms
Successful clicks per Second: 1.78 (equals 6,418.09 Clicks per Hour)

Results of period #11 (from 102 sec to 112 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 11 ms
Successful clicks per Second: 1.98 (equals 7,129.16 Clicks per Hour)

Results of period #12 (from 112 sec to 123 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 39 ms
Successful clicks per Second: 1.98 (equals 7,139.52 Clicks per Hour)

Results of period #13 (from 123 sec to 133 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 11 ms
Successful clicks per Second: 1.98 (equals 7,131.84 Clicks per Hour)

Results of period #14 (from 133 sec to 143 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 10 ms
Successful clicks per Second: 1.98 (equals 7,137.31 Clicks per Hour)

Results of period #15 (from 143 sec to 153 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 60 ms
Successful clicks per Second: 1.98 (equals 7,134.10 Clicks per Hour)

Results of period #16 (from 153 sec to 163 sec):
****

Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 60 ms
Successful clicks per Second: 1.98 (equals 7,132.69 Clicks per Hour)

Results of period #17 (from 163 sec to 173 sec):
****
Completed Clicks: 18 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 12 ms
Successful clicks per Second: 1.75 (equals 6,291.39 Clicks per Hour)

Results of period #18 (from 173 sec to 183 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 83 ms
Successful clicks per Second: 1.95 (equals 7,035.91 Clicks per Hour)

Results of period #19 (from 183 sec to 194 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 15 ms
Successful clicks per Second: 1.96 (equals 7,067.80 Clicks per Hour)

Results of period #20 (from 194 sec to 204 sec):
****
Completed Clicks: 20 with 0 Errors (=0.00%)
Average Click Time for 10 Users: 15 ms
Successful clicks per Second: 1.98 (equals 7,143.04 Clicks per Hour)

Results of complete test
****

** Results per URL for complete test **

URL#1 (cumt): Average Click Time 46 ms, 197 Clicks, 0 Errors
URL#2 (cumt): Average Click Time 14 ms, 199 Clicks, 0 Errors

Total Number of Clicks: 396 (0 Errors)
Average Click Time of all URLs: 30 ms

!! Glossary:
!! Click: A simulated mouse click of a user sending a request (one of the URLs from the URL list) to the server and immediately requesting any necessary redirects, frames and images (if enabled).

!! Request: A HTTP request sent to the server regardless of an answer.
!! Hit: A completed HTTP request (i.e. sent to the server and answered completely). Hits can be the PAGE request of a "click" or its frames, images etc.
!! Time for DNS: Time to resolve a URL's domain name using the client system's current DNS server.
!! Time to connect: Time to set up a connection to the server.
!! Time to first byte (TFB): Time between initiating a request and receiving the first byte of data from the server.
!! Click Time: The time a user had to wait until his "click" was finished (including redirections/frames/images etc.).
!! User Bandwidth: The bandwidth a user was able to achieve.
!! Sent Requests: Number of requests sent to the server during a period.
!! Received Requests: Number of answers received from the server during a period.

(2) Results per URL:

URL#	Name	Click Delay [s]	URL	POST data (or @filename@)	Username	Password
1	cumt	6	www.cumt.edu.cn			
2	cumt	5	http://jwxt1.cumt.edu.cn			

图 3-6 Results per URL

(3) Results per User:

User No.	Clicks	Hits	Errors	Avg. Click Time [ms]	Bytes	kbit/s	Cookies
1	3	105	0	445	650,906	3,900.68	
2	3	105	0	458	650,876	3,792.77	
3	3	105	0	443	650,876	3,919.74	
4	3	105	0	416	650,876	4,167.52	
5	3	105	0	386	650,876	4,498.11	
6	3	105	0	397	650,876	4,373.94	
7	3	105	0	713	650,876	2,435.72	
8	3	105	0	406	650,876	4,277.67	
9	3	105	0	427	650,906	4,068.33	
10	3	105	0	385	650,911	4,511.34	

图 3-7 Results per User

3.3 查看图形化分析

点击 Test Results 中的 Graphs 查看图形化分析。下列是 Graphs 下的选项卡。

（1）Hierarchy:

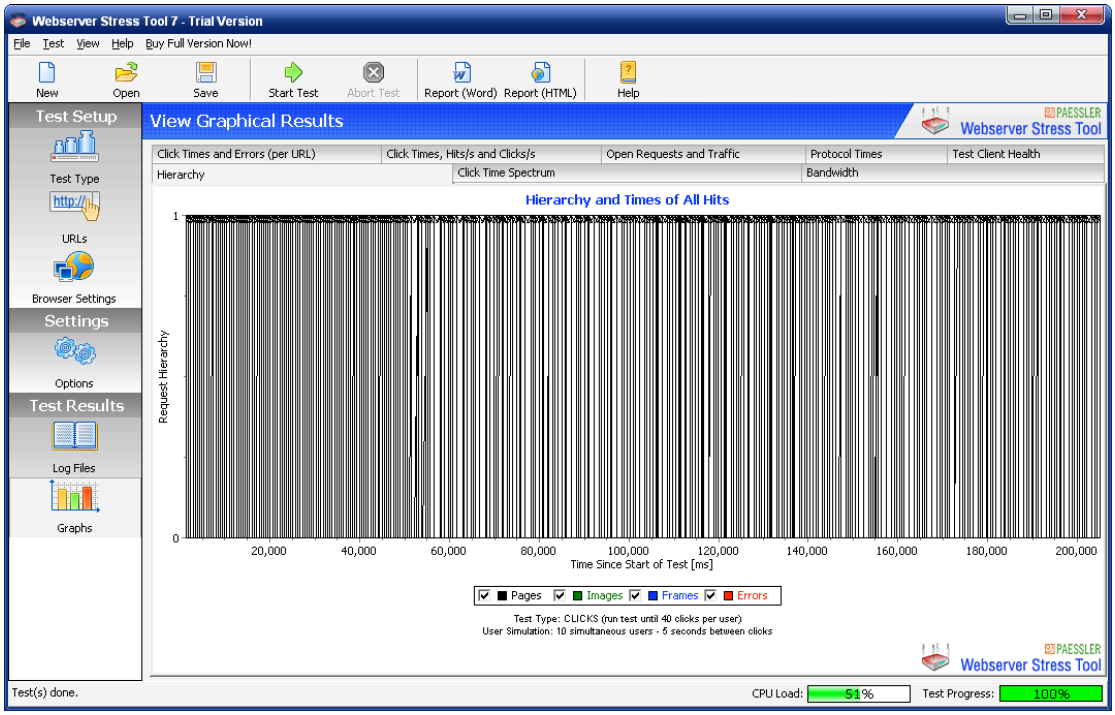

图 3-8 Hierarchy

（2）Click Times,Hits/s ,Users/s:

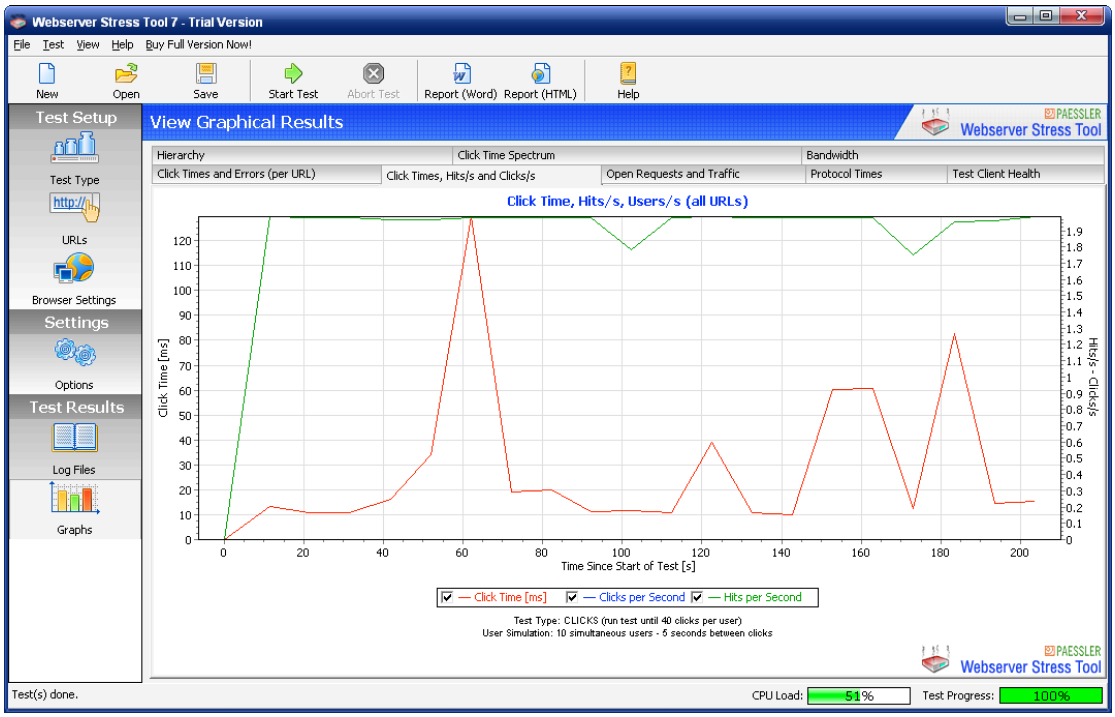

图 3-9 Click Times,Hits/s ,Users/s

(3) Click Time Spectrum:

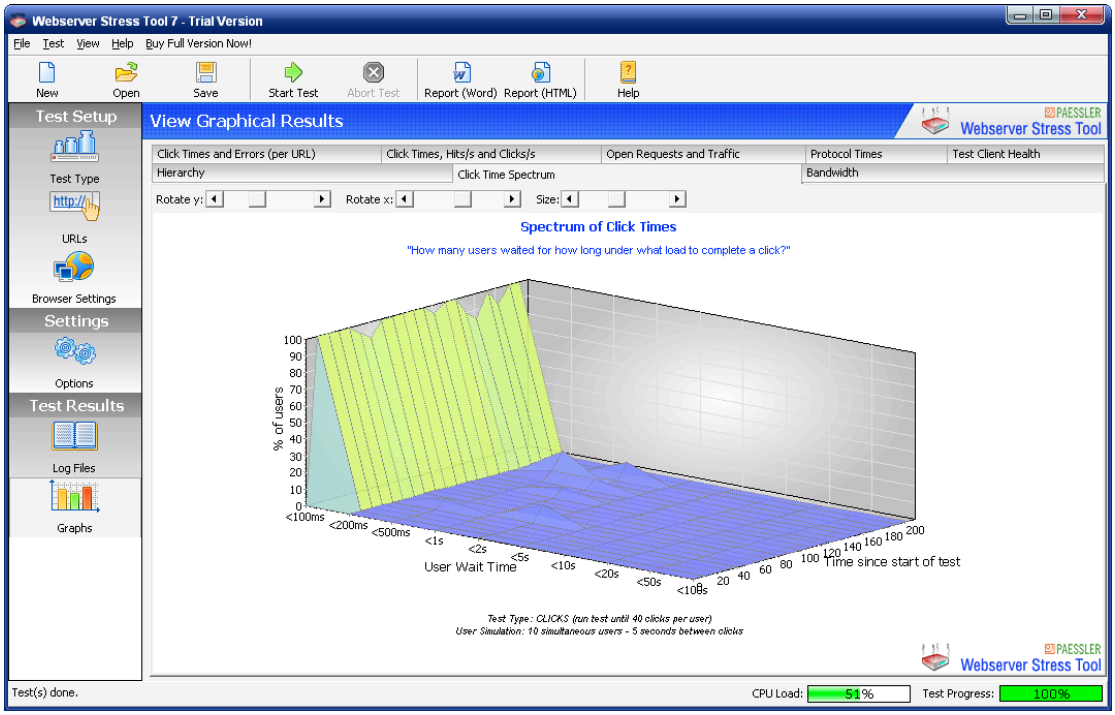

图 3-10 Click Time Spectrum

（4）Open Requests and Traffic：

Client 段的 CPU LOADING、Memory Load、数据传输峰尖值

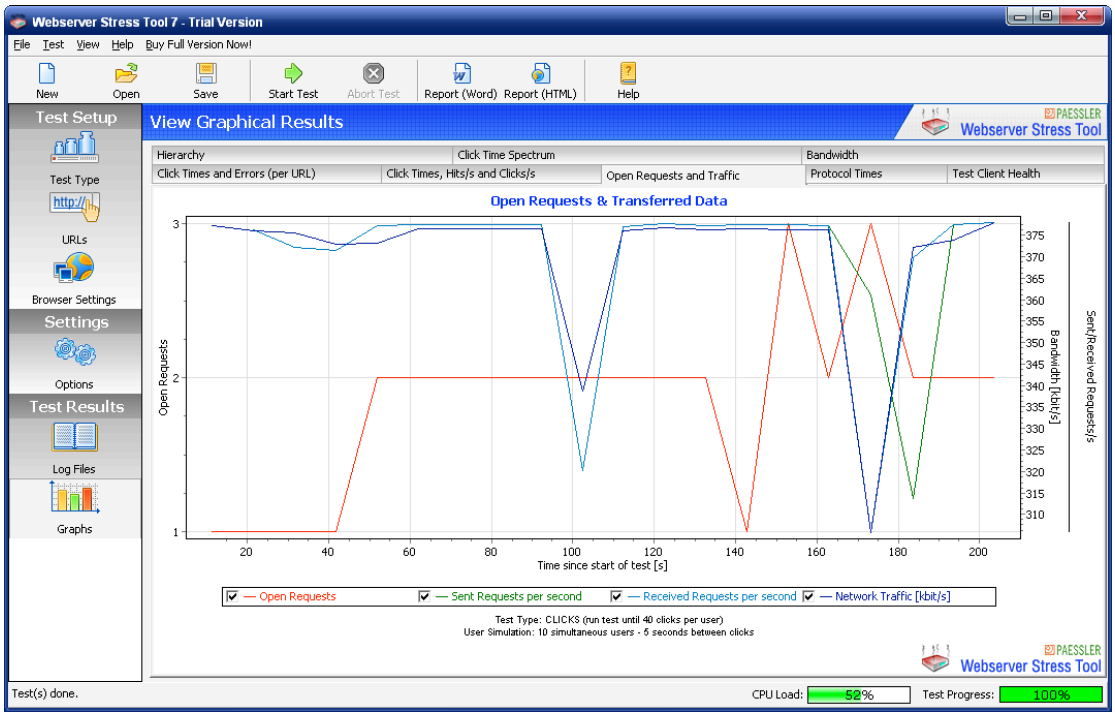

图 3-11 Open Requests and Traffic

（5）Test Client Health

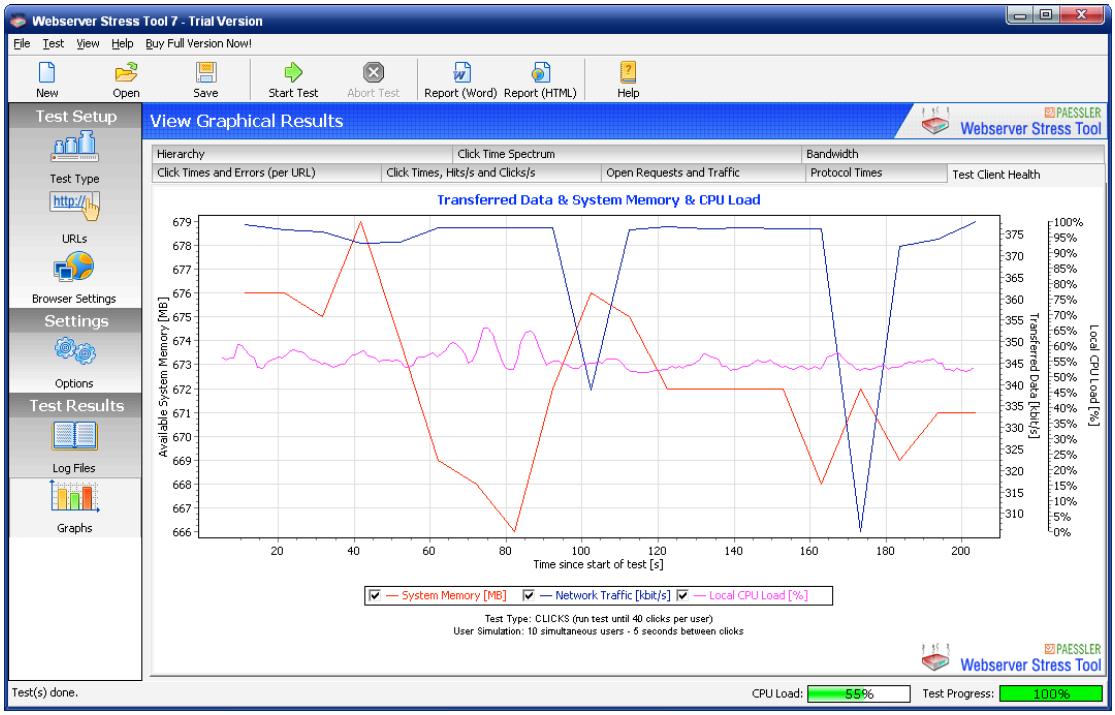

图 3-12 Test Client Health

（6）Bandwidth:

主机与 Client 之间的使用带宽折线图

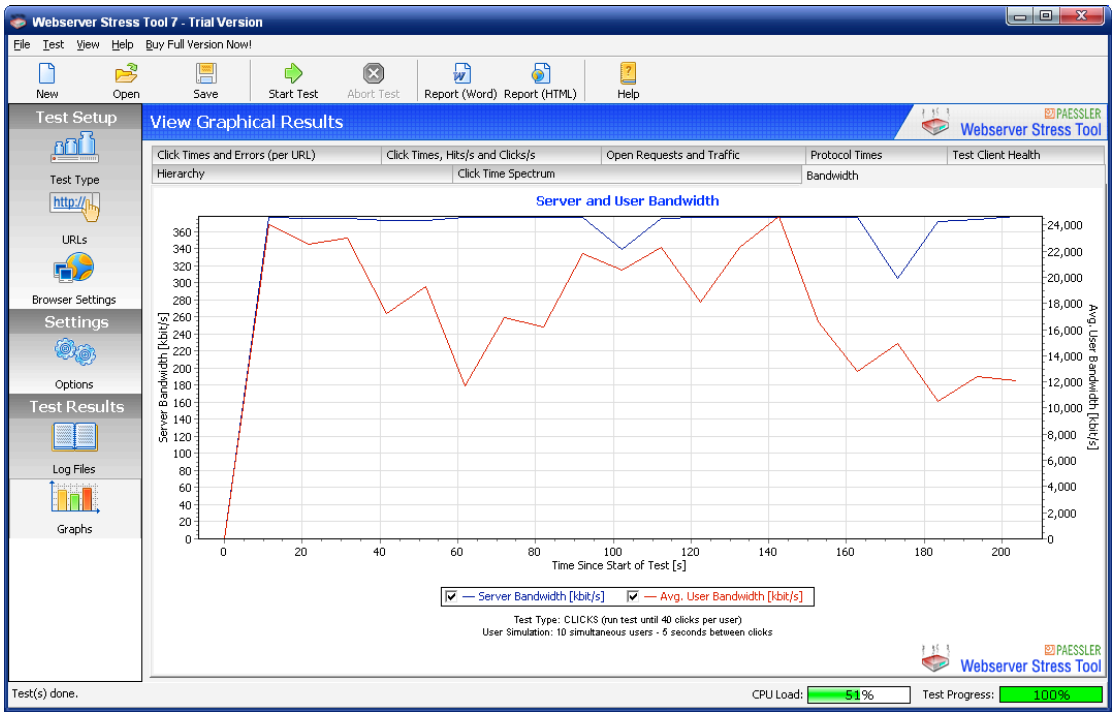

图 3-13 Bandwidth

4 实验体会

通过本次实验，我掌握了如何利用 Webserver Stress Tool 来模拟大量用户通过 HTTP 协议访问网站，从而来测试大规模的网络应用。测试后可以看到测试结果，进一步了解了访问网站时的性能。同时了解了关于网页测试技术的一些知识，并能对测试的结果有初步的认识，在今后的学习和工作中一定会受益。