**Authorized reseller of Web Performance, Inc.**

**Exclusive reseller for France, Belgium and Switzerland**

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# Web Performance Trainer™

## simulates multiple users hitting your web site, so you can easily find performance bottlenecks, increase performance, or do capacity planning.

# 1. OVERVIEW

**How Many Users Can Your Web Site Handle?**

**New feature in Web Performance Trainer™ 2.5! The User Capacity Report identifies exactly how many users can be handled using your own performance criteria such as page load time.**

**Which Web Pages Are Slow?**

**New feature in Web Performance Trainer™ 2.5! The Peak Page Duration report ranks the slowest web pages, and presents pre-configured graphs to display important statistics.**

**Does My Site Crash Under Load?**

**Errors are detected at three different levels, network, HTTP, and application, insuring you'll know if your site is functioning properly under load.**

**How Many Hits/Sec Can My Web Site Serve? What's My Site's Bandwidth Requirements?**

**A wide variety of statistics can be graphed to give you the information required to answer most performance questions.**

Web Performance Trainer™ is your solution to the problem of finding out how many users your web-based application can handle. It is designed to be up and running in a few minutes, so you can get an accurate picture of your scalability in under an hour. Once you have the basic information you need, you can re-run the tests while tuning your back-end or swapping out equipment until you find the optimal combination.

Because Web Performance Trainer™ is based on recording browser/server interaction rather than emulating a browser, it is extremely accurate. Most other load testing tools have you configure URLs to test, depending on the testing software to parse the URL and simulate how the browser will parse that page. In reality the different browser versions parse web pages differently, and complex web pages may themselves contain directions to execute cgi-bin or other scripts located on other computers as well. By using recording, you can see exactly what is happening between the browser and server, and pinpoint bottlenecks using our analysis tools.

# 2. FEATURES LIST

## Modem Simulation

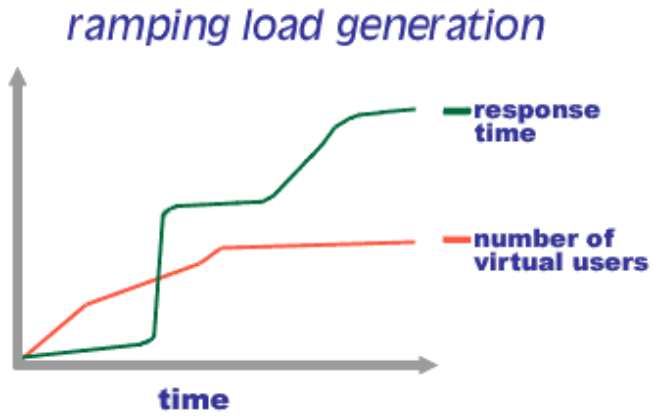
Each virtual user can be bandwidth limited so that it accurately simulates a user accessing the web site using a variety of modems, including cable modems, or a LAN. This is important because the slower the user's connection to your site, the more I/O buffering is required, and the longer sockets are kept open, all of which affect how your web server is tuned. You can even configure a mix of bandwidths, where 70% of the users are connecting at 56K modem speeds, 15% are connecting at cable modem speeds, and 15% are connecting at LAN speeds.

## Realistic Browser Simulator

Each virtual user behaves exactly as a browser, sending requests to the web server, and then reading back the reply, including error parsing. All of the web pages requested are read back from the web server, keeping open socket connections like a real browser. When combined with the modem simulation, this places a much more realistic load on a web server than the typical load tester. Another key feature is "**Think Time**", which during a load test simulates the time the user would take to actually read a web page or fill out a form. Because the think times are generated from a recording of a user actually using the site, the think times are representative of what your site will see when it goes live. Of course, all of these features are configurable, so you can choose a combination that best models your user base.

## Ramping Load Generation

You can dynamically vary the number of virtual users hitting your site, so you can see how the performance varies according to load.




## Use Case Modeling

You can define transactions that are unique to your business, and group them in new ways to simulate existing or new load patterns. We call these "**Business Cases**". This allows the statistics to be gathered in ways that are meaningful to your business. Examples of typical business cases include logging in to a site and making a purchase, performing a search or filling out a form.

## Complex Tests

In order to simulate the same complexity of user traffic seen on a live web site, you can run multiple business cases at the same time, each with different characteristics. For example, you can have 20% of the simulated users making a purchase, while 60% of the users are looking at product material and the remaining 20% are doing searches.

## Test Case Recording

It is easy to create test cases by simply browsing the web site. Each recorded test case can then be edited, copied, and pasted or combined into load profiles.

## Multiple Browser Support

Full support is given for recording from all web browsers on all supported platforms, including but not limited to Internet Explorer, Netscape, Mozilla, Konquerer and Opera.

## Multiple Platform Support

Web Performance Trainer™ can run on a variety of platforms, including **Windows NT**, **Windows 2000**, and most forms of **UNIX** or **Linux**.

## 3 Levels of Statistics

You can view statistics at any level possible in a web site, including the transaction, web page or individual URL level. The statistics collected include:

1. min, max, and average time to first byte
2. min, max, and average time to last byte, also known as web page load time
3. hits/second
4. bytes/second
5. error count
6. users

## Dynamic Session Handling

Web Performance Trainer™ automatically makes sure each virtual user is seen by your web server as a real, unique user with no configuration needed. Each virtual user interacts with a web server's session tracking mechanism exactly the same way as a browser, so your web server cannot tell the difference between a real and a virtual user. Note that session tracking through URL rewriting is not supported at this time.

## Authentication

Many web sites, including e-commerce sites, require the user to login to site using a username and password. Web Performance Trainer™ supports most authentification techniques, including forms and basic authentification. Using runtime data replacement each virtual user playing back a recorded business case can log in as a separate user.

## Runtime Data Replacement

For application specific items such as user name and password identification, Web Performance Trainer™ has filters that allow you to easily assign new user names and passwords for each virtual user. The same technique is used to put in unique values for any type of parameter that flows between the browser and server. This flexibility allows us to handle the many different ways of communicating between a browser and web server in order to handle the largest number of configurations. The types of parameters that can be changed at runtime include: **Authorization**, **URL Parameters** and **Form Fields**.

## Runtime Test Feedback

While a performance test is running the user can view playback statistics, as well as view the details of any errors detected. Statistics that can be monitored during playback and include

1. total hits
2. hits/sec
3. bytes/sec
4. business cases executed per minute
5. total errors
6. active virtual users

If remote playback engines are being used, the number and status of those machines can also be monitored.

## Multiple Playback Machines

You have the option of generating virtual users from a single machine or distributing this task among any number of computers. This allows the product to generate very large numbers of virtual users, limited only by the number of computers at your disposal.

## Load Balancing

In order to get the maximum capability and accuracy for the computer performing the load test, Web Performance Trainer™ detects at runtime your test computer's capabilities and adjusts the test accordingly. If you are using multiple playback engines, then the controller automatically sends more tasks to the more capable computers.

## SSL

SSL is a requirement for secure transactions such as online credit card purchases or transmitting passwords securely. Web Performance Trainer™ supports the latest versions of SSL and tested both old and new versions of Internet Explorer, Netscape, and Mozilla on all of the supported plarforms.

## Analysis

After running a test, Web Performance Trainer™'s analysis reports provide quick answers to key questions about your website performance, such as "What was the slowest page on my website", "What was the longest load time for the 'order summary' page?" and "How many users can my website handle?" The Peak Page Duration Report summarizes all the web pages in the test based on the peak (longest) duration recorded for the test run and indicates the time when the maximum occured as well as the number of users running at that time. The User Capacity report determines the capacity of your website based on the selected test results and configurable performance thresholds.

## Graphing

Often the best way to view data is in graph format. Web Performance Trainer ™ has powerful **graphing** capabilities that allow any parameter to be graphed at any level, so you can view any statistic available in a variety of ways. The results for multiple tests can be graphed, so you can detect changes in performance between test runs. This is great for performance tuning, where you can tweak the configuration of your web server or application server, and see how the changes affect performance.

## Data Export

Sometimes you may need to manipulate the statistics gathered by Web Performance Trainer™ or run your own analysis algorithms. To support this, data can be exported into most spreadsheets, such as Microsoft Excel or StarOffice or even imported into custom programs. Graphs can also be exported as images, so they can be easy imported into Microsoft Word, Lotus Notes, StarOffice, Word Perfect, Microsoft PowerPoint, etc.

## Applets and ActiveX

Web Performance Trainer™ supports applets and ActiveX components that work through firewalls. The actual applet and ActiveX component themselves are not tested, since the object of the performance test is to test the web server, not the browsers. Instead, the communication between the component and the web server is captured and then recreated during the testing process.

## Multi-Product Support

No matter how your back-end is implemented, Web Performance Trainer™ supports can capture the interaction between the browser and the back-end and simulate your users. Its been tested with all of the major web servers, application servers, and operating systems.

# 3. A TYPICAL SESSION WITH WEB PERFORMANCE TRAINER™

## 1. Choose a browser

The first step is to configure your browser to use Web Performance Trainer™ as a proxy server. Both Netscape and Internet Explorer, as well as other browsers, support the use of proxy servers. Web Performance Trainer™ sits between your browser and your web server, recording all communication between the browser and the web server.


## 2. Record business cases

The next step is to think about how your users interact with your web site, and divide up the interactions into business or use cases.

Typical business cases include such things as:

1. Signing up for membership
2. Searching for a product
3. Purchasing a product
4. Visiting the product support page...

## 3. Describe usage patterns

The business cases can be grouped into any number of usage patterns to simulate current and future use of your web site. Each usage pattern can distribute the number of users among the business cases in different percentages, as well as change the connection speed of those users. Many testing tools simply play back interactions as fast as possible; in the real world data takes time to be transferred, and users need time to fill out forms.

## 4. Run test

Web Performance Trainer™ can generate over six million transactions a day, but most of the time you can get an accurate picture of the web server's performance in under ten minutes. Just specify a starting number of users, and Web Performance Trainer™ will increment that number automatically to get a picture of how the response time varies when the load changes.


## 5. Graph results

The graphs show some of various ways of looking at performance data. By comparing the average time it would take for the user to complete the business cases you can determine if your back end is fast enough. In version 2.5, two new reports have been added. The User Capacity Report identifies exactly how many users can be handled using your own performance criteria such as page load time, and the Peak Page Duration report ranks the slowest web pages, and presents pre-configured graphs to display important statistics.

# 4. SYSTEM REQUIREMENTS

## Supported Operating Systems

In order to run a load test you need at least two machines, one for running your web server, and another for running Web Performance Trainer™. The operating system requirements listed below are for the machines running Web Performance Trainer™ only, which is independent of the web server and the operating system of the machine upon which the web server is running.

Web Performance Trainer™ consists of 2 parts, a **controller** and a **load generating engine**, which by default are run together. In order to run the controller you need to have a graphical user interface installed, which means the Solaris and Linux computers must have X installed. The load generating engine can be broken out and run on a separate machine, which doesn't require a user interface, and thus can be run on headless servers.

| Operating system | Version |
|---|---|
| Windows XP | - |
| Windows NT | 4.0 SP6 |
| Windows 2000 | SP2 |
| Linux | Tested on RedHat 6.x & 7.x, Mandrake 7.2.<br><br>Note that RedHat 7.1 and 7.2 require small patches. |
| Solaris | 2.6, 2.7 and 2.8.<br><br>Several patches and font packages are required, although a fresh 2.8 install should include everything automatically |

**Why no support for Windows 95/98/ME/XP?**

Generating traffic on a web server takes an operating system that is designed to run multiple simultaneous threads of execution. Desktop versions of Windows are designed for single user use, and don't give reliable performance or results in a demanding stress test.

## Hardware Requirements

Simulating multiple virtual users/browsers hitting a web site is a CPU and memory intensive operation. The most common question is "*what type of hardware do I need to test my website?*" The answer depends on the type of tests you will run, but the minimum requirements for a realistic simulation are:

| Virtual Users | CPU MHz | Memory MB |
|---|---|---|
| 100 | 400 | 128 |
| 200 | 400 | 256 |
| 400 | 600 | 256 |

The number of virtual users a single computer can generate is currently limited to 500 virtual users. This was done to insure the accuracy of both the simulated users and the statistics. This limit is currently being re-evaluated with faster computers, and preliminary results show indicate that up to 1000 virtual users can be simulated on a single fast computer. Note that this new feature will be incorporated into a future release but no release date is currently available.

## Memory Requirements

By default Web Performance Trainer™ uses 64MB of memory, so your computer should have at least this much available. Because statistics are gathered on a per-URL basis, playing back tests with larger numbers of URLs requires larger amounts of memory.

# 5. COMPATIBLE PRODUCT LIST

Web Performance Trainer™ simulates browsers using the standard HTTP protocol, communicating with your web server in exactly the same way as real browsers. By simulating many browsers using your web site simultaneously, it loads your web server and your back end in just the same way as real users, allowing you to performance test everything on you back end including the web server, application server, and database. Instead of using an EJB load tester to test your application server, and a separate SQL/database load testing tool to test your database, you can use one product to test everything on your back end.

Of course, there is a big difference between theory and practice, which is why Web Performance test for compatibility with a large variety of products. Here is a list of the products Web Performance use in their in-house testing lab.

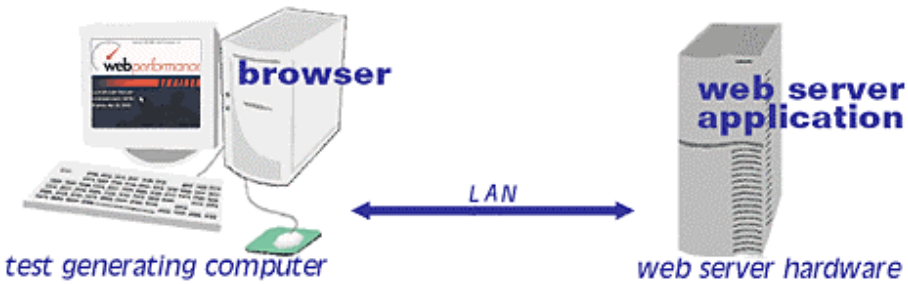
| Web Servers | Application Servers | Technologies |
|---|---|---|
| IIS | WebSphere | EJB |
| Apache | iPlanet | ASP |
| iPlanet | Cold Fusion | PHP |
| Tux | WebLogic | Java Server Pages |
| WebSphere | Enhydra | Servlets |
| And most others… | Tomcat | Applets |
| | And most others… | ActiveX |
| | | And most others… |

# 6. NETWORK CONFIGURATIO N

Web Performance Trainer™ will work in a variety of network configurations to fit your particular situation:

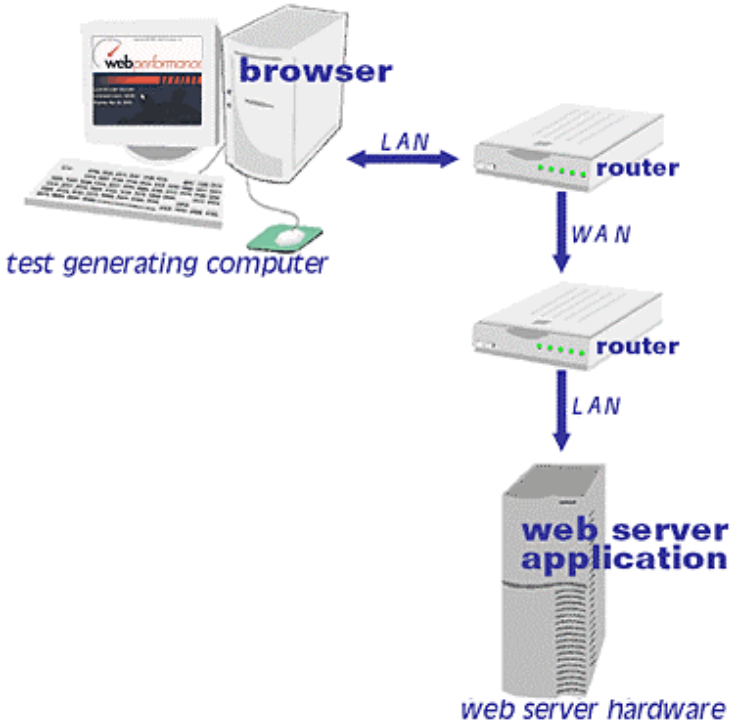
## Lan testing

Web Performance Trainer™ runs on a "Test Computer" that will generate the virtual users that are directed at a Web server or servers to be tested. The most flexible configuration is also the easiest, where you can place the Test Computer on the same LAN as the web server. This has the advantage of reducing network effects on the test because the full LAN bandwidth is available between Web Performance Trainer™ and the web server.




## Remote testing

A common situation is where the person running the test is at another location than the web server. There are 2 ways to handle this situation, which differ in the location of the software generating the virtual users. In the configuration shown below, Web Performance Trainer™ is run at one location, while the web server can reside anywhere on a WAN, in another state, or even another country.

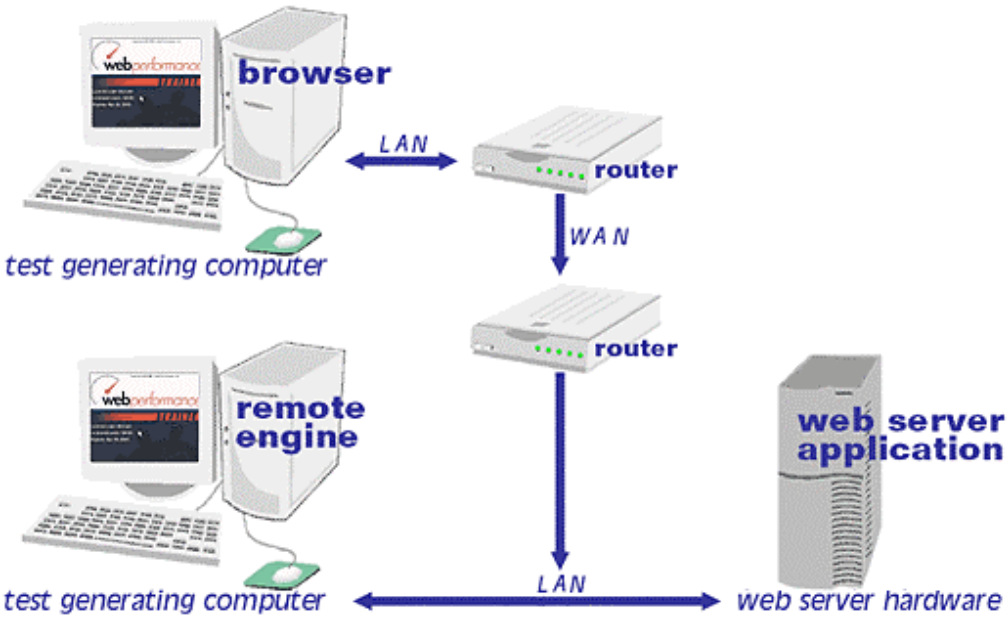



This configuration tests the performance of all networks between the computer generating the virtual user and the web server, as well as the web server itself. The number of virtual users you can simulate is limited by the bandwidth between the test computer and the web server. For example, if the test computer is connected to the internet by DSL with a bandwidth of 200 KBytes per second, you would be able to simulate 40 56Kbit/sec modem connections, which have an affective bandwidth usage of 5Kbytes/sec.

One thing to watch for in this configuration is users at a company location typically share an internet connection, so a performance test would have to be performed when no one's using the network.

Larger simulations require that the dedicated bandwidth from test generating computer to the internet be at least as large as the network connection of the web server. For example, if your web server is connected to the internet by a T3, then the test generating computer has to be connected by a T3 dedicated to load testing.

One way to handle this configuration that eliminates most bandwidth restrictions is to use a remote playback engine. In this configuration Web Performance Trainer™ is split into two parts, a controller, and a playback engine. The playback engine is placed on a computer on the same LAN as the web server, while the controller remains in the remote location. The controller is used to remotely control the playback engine, keeping the heavy network load on the LAN, while allowing remote control over the test.

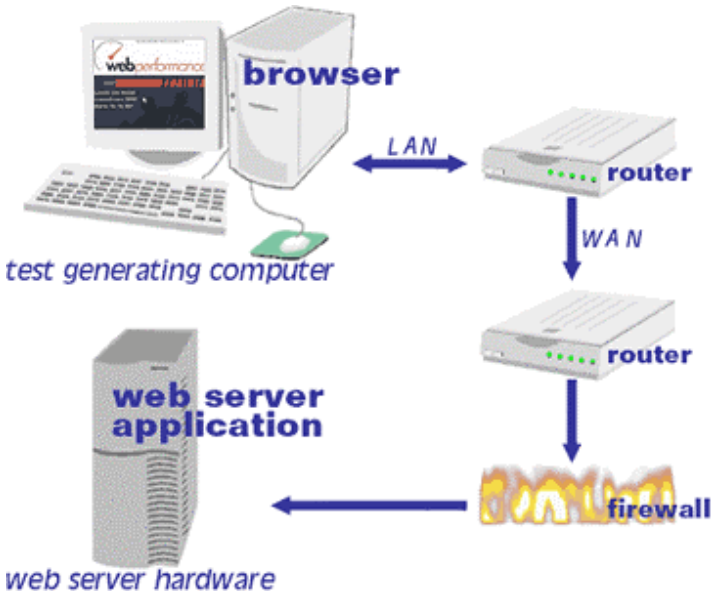



In this configuration care should be taken to stop running the playback engine when its not being used for security reasons.

## Firewall protected Web Server

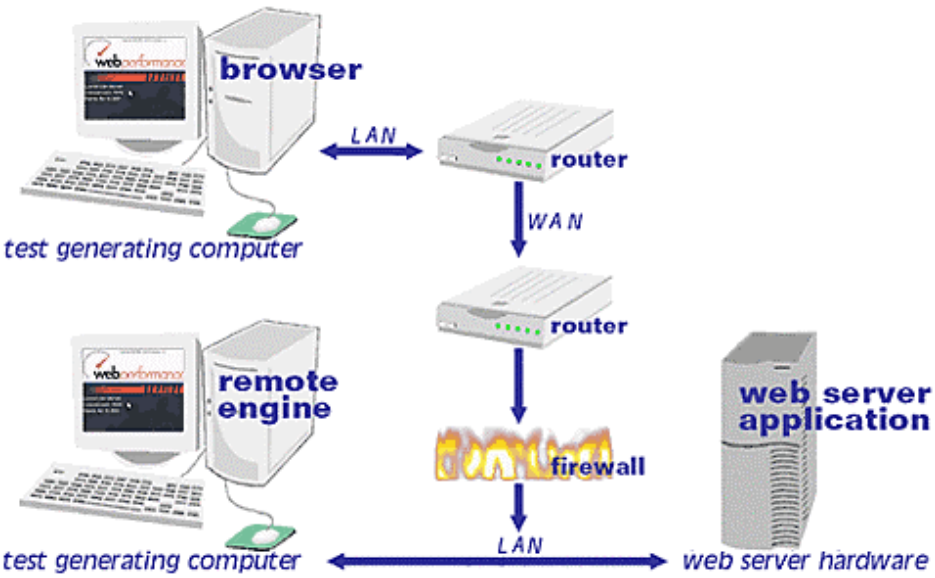
Firewalls complicate the testing procedure, both because they are barriers and because the performance of the firewall is unknown and therefore throws some level of uncertainty into the results. As a practical matter, however, Firewall performance only becomes an issue at very high loads, i.e. several thousands of simultaneous virtual users.

The most common use of the firewall is to protect the web server by preventing all but basic HTTP access. The configuration shown below doesn't change the remote access situation if Web Performance Trainer™ is generating the virtual users remotely. The virtual users will access the web server just like any other user that is being let through the firewall to access the web server.



The second type of firewall configuration is where a virtual user generating engine is placed behind a firewall. This configuration is useful when a testing team at one corporate site is testing a private corporate intranet site at a remote corporate site.

Web Performance Trainer™ supports remote controlling a single load generating engine and multiple engines.




## 7. VIRTUAL USERS

A virtual user is a simulation of a real user created by Web Performance Trainer™.

The virtual users created by Web Performance Trainer™ emulate a browser in every way; the web server can not tell the difference between a real user hitting the web site and a Trainer-generated virtual user. Your web pages are grouped into transactions we call "**Business Cases**" so you can get measurements that have meaning for your business.

The license describes the number of **simultaneous** virtual users. How many simultaneous virtual users you need to simulate depends on a number of factors, starting with how you express your web site's capabilities.

One thing to keep in mind that performance testing starts with testing your individual back-end machines. Most large web sites scale by adding web servers and application servers. Setting up a large multiple server performance test takes significantly more time and resources than setting up a single server test. For that reason, you may want to start testing with a small number of virtual users on an individual test server.

For detailed background information about doing performance tests on a web server we recommend **Web Performance Tuning** by **Patrick Killelea**, published by **O'Reilly**.

# 8. FAQ

## 1. Licensing

**Can I use Web Performance Trainer™ on multiple computers?**

Web Performance Trainer™ is licensed to a single user on a single computer. The user may install Web Performance Trainer™ on several computers only for the purpose of simulating high load that cannot be accomplished on a single computer. In this situation the user may run the Web Performance Trainer™ Playback Engine on as many computers as needed to simulate the required number of users - but the Web Performance Trainer™ Controller may only be run on one computer.

## 2. Compatibility

**2.1 What platforms does Web Performance Trainer™ support?**

There are possibly 3 questions here. Please see the next 3 questions. Note that Web Performance Trainer™ should NOT be run on the same computer as your web server.

**2.2 What platforms does Web Performance Trainer™ run on?**

Please refer to the *Supported Operating Systems list*.

**2.3 What Web/Application servers does Web Performance Trainer™ work with?**

All web servers and web application servers are compatabile with Web Performance Trainer™. In addition, any application server that delivers the application via the HTTP protocol will also work with Web Performance Trainer™. The extensive list of app servers that we have tested against includes Apache, IIS, WebSphere, WebLogic, iPlanet. However, if you have configured your server to only use the URL-rewriting technique for session tracking, then Web Performance Trainer™ will not work.

**2.4 What browsers can Web Performance Trainer™ simulate?**

Web Performance Trainer™ supports all of the popular Web browsers. Since Web Performance Trainer™ records HTTP transactions directly from the browser, it can simulate any browser that supports the use of a proxy server.

**2.5 Can we run tests through a proxy server?**

Yes. Starting with version 2.3, Web Performance Trainer™ supports the use of a proxy server. We do not generally recommend performing load tests through a proxy server, since the proxy could become a bottleneck in the test. This could result in false conclusions regarding the performance of the server being tested. However, there are times when this is necessary, even desirable.

**2.6 Does Web Performance Trainer™ work over a modem?**

Technically, yes. However, the product is designed to load test web servers, which requires a high bandwidth connection to the server. The recommended method is to run the program from one or more computers on the same LAN as the web server. Although it should work over a modem, there is no reason to do so since you cannot simulate more than one browser using a modem's bandwidth.

**2.7 How much hardware is required to simulate NNN users?**

This depends greatly on the test cases that you have configured. Certain features, such as SSL, require considerable memory and processor time. Please refer to the *Hardware Requirements* for general recommendations.

# 3. Product capabilities

### 3.1 How many users can Web Performance Trainer™ simulate?

Theoretically, there is no limit - provided enough hardware and bandwidth are available. We have tested over 5,000 simultaneous users in our lab. Results from that test make us confident that Web Performance Trainer™ could simulate many more simultaneous users with a specialized network configuration. In practice, few applications require tests of this size.

### 3.2 Does it support cookies?

Yes, Web Performance Trainer™ supports cookies automatically. No special configuration is required.

### 3.3 Does it support SSL?

Yes, starting with version 2.2, Web Performance Trainer™ fully supports SSL.

### 3.4 Does Web Performance Trainer™ support session tracking?

Yes. Web Performance Trainer™ supports session tracking using cookies. Web Performance Trainer™ does NOT support session tracking using URL-rewriting.

### 3.5 Does it support XML?

If XML is sent between the browser and the server via HTTP, then Web Performance Trainer™ will support it. If it sent via some other protocol, then the answer is no.

### 3.6 Does it support WAP?

No.

### 3.7 Does it support COM or DCOM?

No.

# 4. Installation and Configuration

### 4.1 On what computer do I install Web Performance Trainer™?

Web Performance Trainer™ should be installed on a fast machine on the same LAN as your web server. No software is installed on your web server, making the installation easy. Note that the test machine can be running any of our supported operating systems, and must meet the minimum hardware requirements.

### 4.2 I can't open the license key you sent me... how do I open it?

Please don't try to *open* the license key. It is an encrypted binary file that can only be read by Web Performance Trainer™. You should save the file to the required location (see the next question).

### 4.3 Where should I save the license key?

You should save the license key (called *WPTrainer.license* onto your desktop). When you start Web Performance Trainer™, it will ask for the location of this license key.

### 4.4 How do I save an attachment from my e-mail program?

We cannot provide support for every e-mail application available. Please consult the user manual for your e-mail application. In some of the more popular e-mail applications, right-clicking on the attachment will show a menu with an entry such as "Save As...". Use this menu item and then select the proper name and location for the file.

### 4.5 I need to import a new license key. How do I get WPTrainer to ask me for the license key again?

You can import a new license key using the File->Import menu item.

### 4.6 My browser is already configured for a proxy server. What should I do?

If the servers you intend to test can only be accessed through the proxy server, then you will need to configure Web Performance Trainer™ to use the proxy server (this is explained in the manual). If you do not need the proxy server for testing your servers (for instance, the proxy server gives you access to the Internet), then you have two options:

1. You can configure the browser's proxy settings for Web Performance Trainer™ when you are using Web Performance Trainer™ and switch them back when not using Web Performance Trainer™.
2. You can configure Web Performance Trainer™ for the proxy server and configure the browser to use Web Performance Trainer™ as it is proxy. Under this configuration, you browser will be using both proxies to access the Internet and you will need to have Web Performance Trainer™ running whenever you want to to access the Internet.

### 4.7 I get a "Port In Use" message when I start Web Performance Trainer™...

Web Performance Trainer™ uses two ports to provide a proxy for the browser - the defaults are 8081 and 8082. It is possible that another application also uses these ports. If you wish to change the ports that WPTrainer uses you can do so in the Proxy tab of the Properties dialog. If you are using manual browser configuration, don't forget to change the browser property settings to match the port numbers that you select.

### 4.8 When I run the Windows installer, the first screen appears, but then nothing happens

Check the graphic configuration of the computer. Both Web Performance Trainer™ and the installer require a minimum 256 color video configuration.

## 5. Recording and Customizing a Test

### 5.1 My application has a form where the user enters data. How can I simulate different data entered into the form during the load test?

Please see the section of the user manual titled "Form Data Replacement".

### 5.2 My application requires a username/password for access. How can I make the virtual users use different username/passwords to simulate multiple users logging in at once?

Please see the section of the user manual titled "Authentification".

### 5.3 Why does Web Performance Trainer™ automatically close my browser windows?

When Web Performance Trainer™ is configured to automatically configure the browser settings, it must adjust the proxy settings in your browser. To ensure that your browser remains fully functional when Web Performance Trainer™ is shut down, Web Performance Trainer™ must control when the browser reads and saves those settings. The only way to guarantee that the correct settings are restored in your browser is to ensure the browser is started/stopped at the correct times.

## 6. Running a Test

### 6.1 How can we tell if it is working?

Turn on logging on the web server being tested, and then follow these instructions for verifying that it is working. Please see the section of the user manual titled "How do you know its working".

### 6.2 There were login errors during the test, but Web Performance Trainer™ does not show them. Why?

It depends on how the web server indiciated there was an error. For instance, if there is a login page and you know the that the username/password should not be accepted, but Web Performance Trainer™ does not report an error. If the server simply returns a web page that says "Sorry, login is rejected", but reports an response code (200) that indicates the transaction is successfull, there is not way for Web Performance Trainer™ to know that this is an error. You must either change the server software to return an appropriate HTTP response code, or configure validation on the response page to verify that a valid response was received.

### 6.3 Why does my computer go to 100% CPU utilization when I am only running 10 virtual users?

The most common cause for this behavior is using the 'unlimited' network speed setting (sometimes even the 1M or 10M settings will also cause this). This setting causes each virtual user to communicate with the server as quickly as possible...using up as much bandwidth as possible. This requires a lot of processor activity to process and analyze this much data. It is natural that you can only simulate a few users under these conditions.

## 7. Analyzing Test Results

### 7.1 Why are the statistics for my business cases all zeros?

For business case statistics, they are meaningless until the entire case has been executed at least once. This means the values will be zeros until one of the virtual users has finished playing back the business case once. For example, there can be no average duration of a transaction until that transaction has completed. Basically, you need to run the test longer.

### 7.2 How can I determine the total load time for a web page during a test?

On the statistics tab, select the test, business case, and web page you are interested in. Then in the stats table, look at the column titled "Average Duration". This will show you the average duration for that page for each sample period in the test.

# 9. DICTIONARY OF TERMS

## Business Case

An interaction the user has with the web-based application or website that has meaning in a business context. It could be as simple as viewing a single page, or as complicated as performing an entire transaction. In Web Performance Trainer™, this represents a series of HTTP Transactions that should be repeated by virtual users during a test.

## Cache

The web browser maintains a copy of recently requested resources (pages, images etc.) so that when the resource is needed again, it does not have to ask the server for another copy. This greatly improves the performance of the browser - especially on a graphics-laden website where images (menu bars, for instance) are reused on multiple pages.

## Controller

Web Performance Trainer ™ can be run in 2 modes - as the controller or as an engin. In controller mode, Web Performance Trainer ™ presents a GUI that allows the recording, editing and execution of load tests. Only one controller may be run on a network with the same license key.

## Cookie

A small amount (less than 1k usually) of text that a web server asks the web browser to store on the browser computer. This information is sent back to the server each time the browser makes a request for an URL on that server. This is the most common (and most preferred) method of session tracking. Contrary to popular opinion, cookies cannot be used by hackers to run harmful programs on your computer or steal account numbers from your Quicken™ files (except for Microsoft Internet Explorer - which requires a security patch to prevent such abuse).

## Delay Time

The amount of time between receipt of one URL and the request of the next URL. Web Performance Trainer ™ records this duration while recording a business case and uses it to accurately simulate a users behavior when performing a test. When a delay time occurs between a web page and the first image (URL) on the web page or between two images on a web page, the delay time is usually due to the processing time required by the browser to parse the page and render it (and the images) on the screen. When the delay time occurs after the final image in a web page and the next web page, the delay time represents the time spent by the user reading the page and deciding what to do next. In this case, the delay time is referred to as Think Time.

## Engine

Web Performance Trainer ™ can be run in two modes - as the controller or as an engine. In engine mode, Web Performance Trainer™ presents a console interface and listens for commands from a controller. It is used by the controller for generating virtual users. Many engines can be used by a controller to generate massive network loads.

## FTP (File Transfer Protocol)

A network protocol for sending and receiving files. FTP is built on top of TCP/IP.

## HTTP (Hypertext Transfer Protocol)

The protocol used between web browsers and web servers to transfer web pages and associated files (images, etc). It is the language of the World Wide Web. HTTP is built on top of TCP/IP.

## HTTP Transaction

A request sent from the browser to the server and the corresponding response from the server to the browser, both sent using HTTP. This round-trip communication path allows the browser to request a resource (URL) and receive a response from the server. It may include content sent by the browser (data entered in form fields, uploaded files) and content returned from the server (web page, image, etc).

## Host

A computer that is connected to a TCP/IP network, including the Internet. Each host has a unique IP address.

## IP (Internet Protocol)

A network protocol that specifies the format of data transferred between two hosts (called packets or datagrams) and the addressing scheme. IP by itself is something like the postal system. It allows you to address a package and drop it in the system, but there is no direct link between you and the recipient. IP is generally used in conjunction with TCP.

## IP address

An identifier used by the IP protocol to identify an individual host. The current version of IP, *IPv4* uses 4 numbers to identify each network address. Each number can be in the range of 0-255. For example, 161.58.192.211 is the IP address of the Web Performance, Inc. web server. Note that certain IP addresses have special meanings. 127.0.0.1 is the 'loopback' address that a host uses to redirect traffic to itself (usually for diagnostic purposes). The address ranges 10.*.*.* and 192.168.*.* are always reserved for internal networks. 127.*.*.*, 0.*.*.* and 255.255.255.255 are also reserved for special uses.

## License key

An encrypted file that contains the critical license information for your installation of Web Performance Trainer ™.

## Multihome

An adjective used to describe a host that is connected to two or more networks or has two or more network addresses. For example, a network server have multiple network interfaces to increase maximum throughput.

## Proxy Server

A server, typically on a private network, that allows access to external network resources. In a common network configuration, the computers on a company network are separated from the Internet by a firewall (for security reasons). Since these computers cannot access the Internet directly to browse web pages, the browser must be configured to use a proxy server (which *is* allowed to access the Internet) to service requests for web pages from the Internet. All common browsers support this configuration, usually in a configuration section titled "Use a Proxy Server".

## Sample Period

A time period during a load test during which data is aggregated. The statistics calculated by Web Performance Trainer ™ are calculated for each sample period during the test.

## Session Tracking

HTTP is 'stateless'. This means that between the time your browser receives a web page and asks for the next page, the server has forgotten who you are - in other words, when your browser asks for the second page, it has no way to know that it was the same browser that asked for the first page. This is obviously a problem for any application that needs to remember who you are - such as an application that requires a login. The notion of a single, unique user browsing from one page to another is referred to as a 'session'. As the web has evolved, several techniques for session tracking have evolved. The most common are cookies and URL-rewriting.

## SMTP (Simple Mail Transfer Protocol)

A network protocol for transferring e-mail messages between servers. Most e-mail systems that send mail over the Internet use SMTP. SMTP is built on top of TCP/IP.

## TCP (Transmission Control Protocol)

A network protocol that enables two hosts to establish a connection and exchange streams of data. TCP guarantees delivery of data and also guarantees that packets will be delivered in the same order in which they were sent. TCP is a little like a phone call - there is an extended connection between two hosts during which either host can send data to the other.

## TCP/IP

the suite of communications protocols used to connect hosts on the Internet. TCP/IP uses combines the TCP and IP protocols to provide addressing and reliable data transfer for a variety of other Inter net protocols, including HTTP, FTP and SMTP.

## Think Time

The time between the browser displaying a page to the user and the user clicking a link to browse to the next page. This time could be the time it takes the user to read the content of the page or decide what to do next. Web Performance Trainer™ records this time when recording a Business Case and uses it to accurately simulate the users when performing a test.

## TTFB

TTFB stands for "Time to First Byte" and is the duration between the time the virtua l user made an HTTP request, and the time the first byte of the response from the web server arrived. This value gives an idea of the responsiveness of the network and web server, and consists of the socket connection time, the time to send the HTTP request, and the time to receive the first byte of the HTTP response.

### URL (Uniform Resource Locator)

A specially formatted string that describes a resource on the Internet. This is used by the browser to determine where on the network the resource is located. A typical URL looks like this:

http://www.webperformanceinc.com/library/dictionary.html

### Virtual User

A software entity, internal to Web Performance Trainer ™, that simulates a real user by repeatedly performing a Business Case during a load test.

## 10. PRICE LIST

Web Performance Trainer™ is licensed to run on a any number of computers to simulate the licensed number of virtual users. Note that generating the larger numbers of virtual users will require the use of more than one computer.

Included with Web Performance Trainer™ is a Basic Support Package, or you have the option of upgrading to a Premium Support Package. New versions of Web Performance Trainer™ are released regularly, and it is more expensive to upgrade than to simply purchase a year's worth of Premium Support. Not only do you receive the upgrades for free, but it includes priority phone and email support as well!

### Basic v.s. Premium Support Comparison

| Feature | Basic Support | Premium Support |
|---|---|---|
| Email support | Non-priority email support. | Priority attention. |
| Phone support | Not available. | Available. |
| Bug Fixes | Bug fix releases are provided free for the version purchased. | The customer can download any release, beta version, or may receive a custom patch. |
| Upgrades | The customer can upgrade to any version published for three months after purchase. | The customer can upgrade to any version published during the year long term of the Premium Support Contract. |

### Length of license

The license holder purchases the permanent rights to execute the purchased program with a one time payment.

### Number of virtual users

The software is licensed for use by a single workgroup to generate up to the specified number of virtual users using any number of computers. While every attempt has been made to provide a realistic view of the software's capabilities, because of the wide differences in computing power between different models, we can not guarantee a particular hardware platform will generate the required number of virtual users. Short term licenses are available to determine the unique capabilities of your hardware. For more information read the hardware requirements. The maximum number of virtual users that can be generated by a single computer is four hundred.

## Premium Support

Premium Support consists of a year of bug fixes and upgrades, and priority support via email or telephone. Telephone and email support are provided during business hours. A year of Premium Support can be added on to your original purchase for an additional 25% cost. If the support contract lapses, the user must purchase an upgrade in order to make the software license current. Premium Support is a great value, since for the price of an upgrade, the customer receives a year of upgrades and phone support.

## Upgrades

An upgrade is where a customer moves to a new version of the software in which the major or minor version number changes. For example, if the customer purchased 2.4, moving to version 2.5 is considered an upgrade. Once the support privileges in either the basic or premium support packages have expired, the user must purchase an upgrade in order to obtain a new release. Since the price of upgrading later is the same as a Premium Support Contract, it makes sense to purchase a Premium Support Contract right from the beginning.

## Pricing Information

| DESCRIPTION | REFERENCE | PRICE €UROS |
|---|---|---|
| **PRODUCT** | | |
| Web Performance Trainer™ - 25 VU | WPT-2-25VU | 749.00 |
| Web Performance Trainer™ - 50 VU | WPT-2-50VU | 1,249.00 |
| Web Performance Trainer™ - 100 VU | WPT-2-100VU | 1,995.00 |
| Web Performance Trainer™ - 200 VU | WPT-2-200VU | 2,995.00 |
| Web Performance Trainer™ - 500 VU | WPT-2-500VU | 4,995.00 |
| Web Performance Trainer™ - 1,000 VU | WPT-2-1000VU | 7,995.00 |
| Web Performance Trainer™ - 2,000 VU | WPT-2-2000VU | 9,995.00 |
| Web Performance Trainer™ - 5,000 VU | WPT-2-5000VU | 11,995.00 |
| Web Performance Trainer™ - unlimited number of VU | WPT-2-UNLVU | 14,995.00 |
| **MAINTENANCE** | | |
| Premium Support - 25 VU | PSS-WPT-25VU | 187.00 |
| Premium Support - 50 VU | PSS-WPT-50VU | 312.00 |
| Premium Support - 100 VU | PSS-WPT-100VU | 499.00 |
| Premium Support - 200 VU | PSS-WPT-200VU | 749.00 |
| Premium Support - 500 VU | PSS-WPT-500VU | 1,245.00 |
| Premium Support - 1,000 VU | PSS-WPT-1000VU | 1,995.00 |
| Premium Support - 2,000 VU | PSS-WPT-2000VU | 2,495.00 |
| Premium Support - 5,000 VU | PSS-WPT-5000VU | 2,995.00 |
| Premium Support - unlimited number of VU | PSS-WPT-UNLVU | 3,745.00 |

# 11. CUSTOMERS

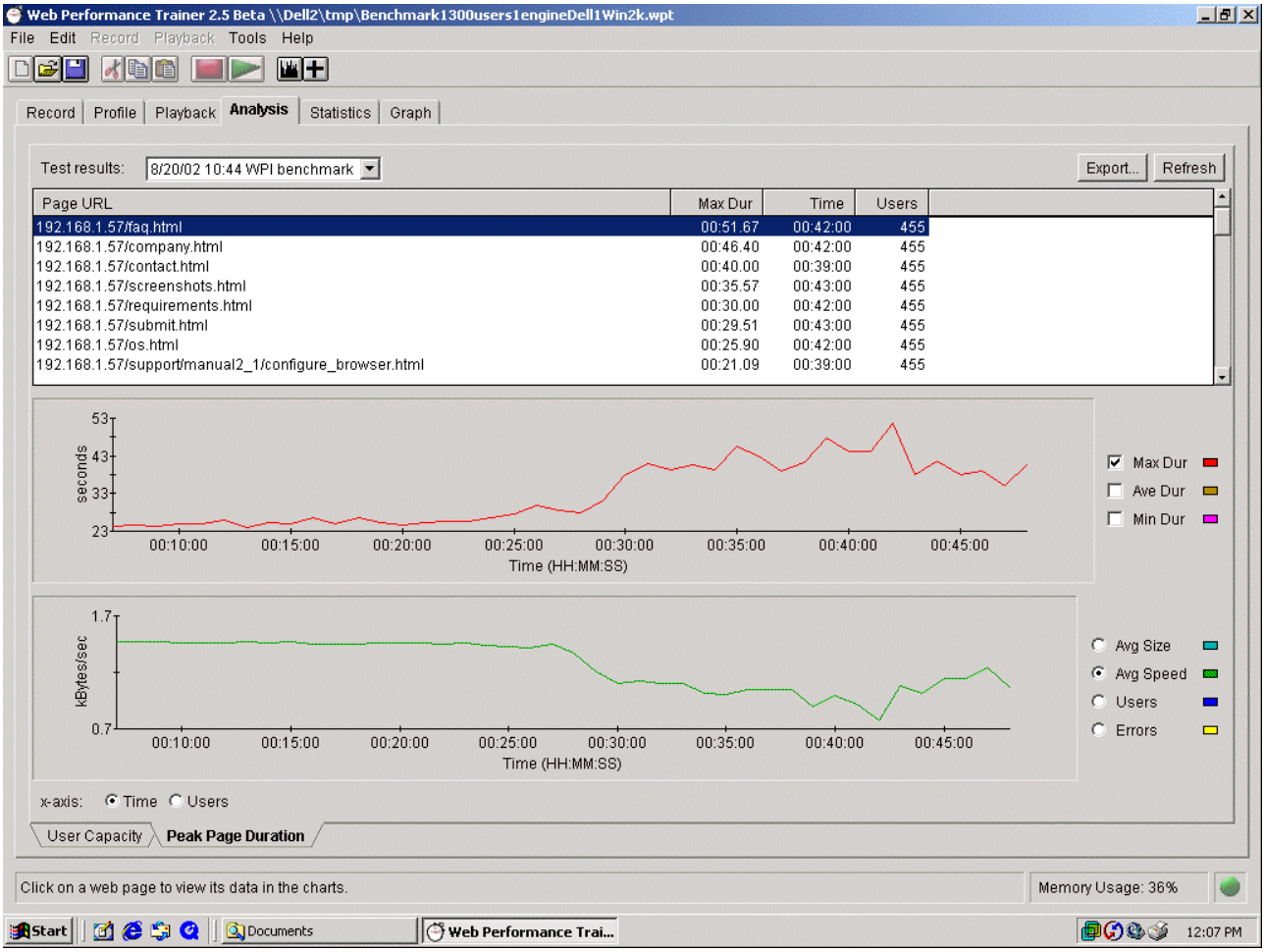
Customers include:

| | | |
|---|---|---|
| AIRBUS France | Eurofactor (France) | Ministère de l'Education Nationale (France) |
| Autoroutes du Sud de la France | Eurogiciel (France) | SEMA (France) |
| ARISEM (France) | Exane (France) | Schneider Electric Industries (France) |
| AXA Investment Managers (France) | France Telecom R&D | Serenis (France) |
| Barclays Bank (France) | Gaz de France | Software AG France |
| Consors France | IFATEC Groupe Euriware (France) | Telenet (Belgium) |
| CROSSAIR AG (Switzerland) | Jet Multimedia | Transiciel (France) |
| DMR (Spain) | Klee (France) | ... |
| | Maas High Tech Software (Germany) | |

# 12. NEW VERSION

**Web Performance Trainer™ version 2.5 has been released on August 2002.**

Considered to be the price/performance leader in the load testing market, version 2.5 leaps past the competition to offer new automatic analysis reports that make load testing easy and accurate. Instead of studying dozens of graphs and tables to look for bottlenecks, Web Performance Trainer™'s automatic analysis reports calculate how many users your web site can safely handle and identify the slow web pages causing the problem.




## How Many Users Can Your Web Site Handle?

The most important number you need to know about a web site is the number of customers that can safely access it at one time. Finding this number is complicated because it must take into account so many variables: the speed of a browser's internet connection, the load time of every web page, runtime errors, security, etc. Because every web site is different, Web Performance Trainer™ is configurable to take into account your web site's unique properties to come up with a realistic evaluation of its capabilities in an easy to understand value: the number of users that can access your site at one time.

## Web Page Bottlenecks

After the capabilities of your web site is measured, the next question is how to increase the site's performance. Web Performance Trainer makes this easy by identifying the web pages that caused the performance problem and making it easy to examine the runtime performance statistics associated with those pages.

# Please contact KAPITEC SOFTWARE

# for further details concerning Web Performance Trainer™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