



# WebSpray™

Web Server Stress-Testing Tool

## User Guide

Version 2.0



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An attempt has been made to state all allowable values where applicable throughout this manual. Any values or parameters used beyond those stated may have unpredictable results.

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# Overview

## Introduction

Do you know how much load your Web servers can handle? Do you know if there are any dead URLs in your site? Are you continuously throwing money at the web site? Can you predict when you will need to upgrade again?

With WebSpray™, the days of guessing are over. Using a simple and intuitive user interface, this powerful, easy-to-use tool allows you to stress-test your Web server or farm of servers. All you need is to enter the hostname or IP address of the Web server, and the results are a click away.

## Quantified Results

WebSpray generates two reports:

- **URL report:** This is a report of all URLs found via a scan of the web site. If there are any URLs in error, they will appear in this report, and can be viewed separately. The default name of the file containing this report is scan.txt and its default location is \My Documents\WebSpray.
- **Performance report:** This is an in-depth performance report that calculates the minimum, maximum, and average, and standard deviation for the connect time, for the download time, and for the number of bytes downloaded. In addition, it reports the total document body bytes downloaded, the total document header bytes downloaded, the document throughput in bytes per second. The default name of the file containing this report is spray.txt and its default location is \My Documents\WebSpray.

## Test Controls

There are a number of controls that can be imposed when testing:

- **Target web site search:** WebSpray will test all the pages found on the target web site, or only specified pages. WebSpray will report any broken links it finds during this process.
- **Testing with multiple clients:** WebSpray is capable of simulating up to 1,000 clients from a single IP address, and is also capable of using multiple IP addresses, with or without aliases. WebSpray's simultaneously from multiple workstations to maximize the load that can be placed on you Web server.
- **Test over time:** To give your Web server a fully stressful work out, WebSpray lets you to choose how many times each client will test the selected pages, or how long the test should last.

# Installing and Registering WebSpray

## Operating Requirements

The PC on which you run WebSpray must meet the following minimum operating requirements:

### PC Hardware

The PC must meet the following hardware configuration:

- A Pentium class CPU. The higher the CPU performance, the more the Web server can be stressed
- A compatible Windows version (as listed in section below)
- 64 megabytes of RAM
- 20 megabytes of disk space
- A Network Interface Card if testing will be over a Local Area Network or broadband connection, or
- A modem if testing will be over a dialup connection.

### Windows Operating System Version

One of the following Windows versions must be installed:

- Windows 98 (SP2, SE)
- Windows NT 4.0
- Windows 2000
- Windows XP
- Windows 2003

### Network Connection

One of the following network connections must be available:

- Local Area Network
- Internet connection T1, T3 or broadband
- Dial-up modem through any ISP

## Installation Procedure

WebSpray installs and registers as a normal Windows application. A system reboot is normally not required.

### New installation

Load the WebSpray CD and run the installation program, wssetup20.exe. Follow the instructions on the screen to complete the installation.

### Upgrade Installation

Load the WebSpray CD and run the installation program, wssetup20.exe. The installation program will detect the existing install and prompt you to Modify it. Follow the instructions on the screen to complete the upgrade.

### Trial Versus Licensed Version

WebSpray can run either as a trial or licensed version. The capabilities of a trial version are constrained, whereas a licensed version has no constraints.

For trial and licensed versions, the program is the same but trial versions expire 30 days after installation.

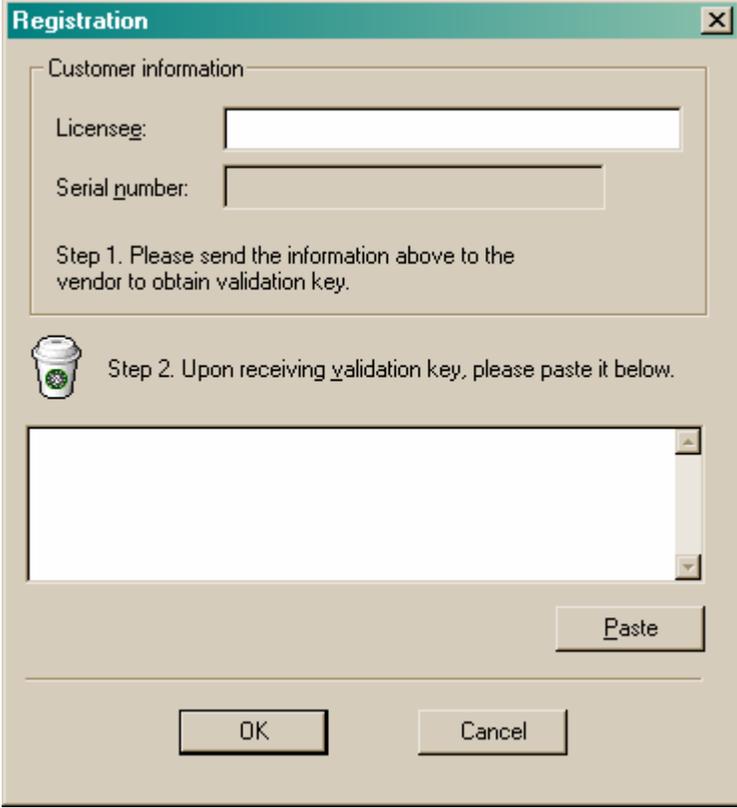
For a trial version, the days remaining in the trial period is shown in the program title and the About WebSpray box. For licensed versions, the name of the licensee is shown in the About WebSpray box.

## Licensing Procedure

WebSpray is normally sent as a trial version for testing. A trial version runs for 30 days and then expires.

A trial version may be converted to a licensed version by applying a license key provided by CAI Networks, Inc. upon payment of a license fee. The Registration screen below is used for registering WebSpray on the computer on which it is installed. You provide licensing

information to CAI Networks, Inc. or its reseller and then receive a validation key to convert the trial version into a non-expiring production version.



The image shows a Windows-style dialog box titled "Registration" with a close button (X) in the top right corner. The dialog is divided into two main sections. The first section, titled "Customer information", contains two text input fields: "Licenseg:" and "Serial number:". Below these fields is a text instruction: "Step 1. Please send the information above to the vendor to obtain validation key." The second section, titled "Step 2. Upon receiving validation key, please paste it below.", is preceded by a coffee cup icon. It features a large, empty text area for pasting the key. A "Paste" button is located to the right of this text area. At the bottom of the dialog, there are two buttons: "OK" and "Cancel".

## De-installation Procedure

WebSpray will deinstall cleanly via the Uninstall program. To uninstall WebSpray, run the Uninstall program and follow the prompts on the screen.



# WebSpray Operation

## Introduction

WebSpray tests Web servers by generating a high volume of connections and page retrievals against the pages they contain. Which Web servers to test and which pages to retrieve are set as configuration options, as well as the volume and duration of testing.

## Modes of Operation

WebSpray performs these tests in two phases:

- In the first phase, the Web servers are accessed and all qualifying pages are identified
- In the second phase, the pages qualified in the first phase are read

The first phase of WebSpray testing is called scan mode; the second is called spray mode. These two modes are independent in that a Web server may be scanned once and then sprayed multiple times using different options.

### Scan mode

In scan mode, WebSpray reads the head page of the Web server, determines all the links it contains, and then follows those links to all subsequent pages and the pages they link to. Through this method, WebSpray is able to “crawl” an entire web site and determine all the pages it references.

All URLs found during scanning are saved for subsequent spraying, and all broken links found in the process are identified and reported.

Statistics are gathered during scanning and reported upon completion of scanning, along with all broken links, in the scan results pane and in the scan results report.

### Spray mode

In spray mode, WebSpray reads pages qualified by the scan for as many times and for as long as dictated by configuration settings. WebSpray will either spray all qualifying pages, or you may instruct WebSpray to spray only certain pages.

Statistics are gathered during spraying and reported upon completion of spraying in the spray results pane and in the spray results report.

## Scope and Volume for Testing

In testing with WebSpray, you have control over what pages are tested and how much testing is done. You can simulate 1,000 users reading an entire Web server ten times, or a single user reading a single page over and over for a period of a week.

### Default Scope of Scanning

WebSpray's default scope for scanning varies based on how the Web server was specified:

- If the Web server was specified by URL, all pages whose starting URLs match the specified URL are qualified
- If the Web server was specified by IP address, all pages linked from that IP address are qualified

By default, pages located outside of the current Web server are not qualified.

### Overriding Default Scope of Scanning

WebSpray's default behavior is effective for most Web servers, but you may find situations in which you want to override the defaults, for example:

- A Web server is specified by URL and links to pages on the same server but under a different URL.
- A Web server automatically redirects to another server.
- A Web server links to other pages on other servers

A number of controls are available to control which pages that WebSpray will read while scanning. You can specify that WebSpray should:

- Qualify only pages that match the full URL or only on the domain name
- Restrict scanning only to pages located in the specified domain or follow links that point to other servers
- Follow foreign links to a specified depth only

These restrictions are imposed via configuration options.

### Restricting Scope of Spraying

For spraying, you may choose to spray all pages qualified by the previous scan, or you can select from among the pages qualified in scan and spray only those.

## Throttling Spraying Volume

The volume of transactions that are generated when spraying can be set in the following ways:

- Pages to spray
- Number of simulated users
- Duration of scanning, specified by time or iterations

## Windows GUI Versus Command-Line Interface

WebSpray is comprised of two different programs offering approximately the same functionality but with two different user interfaces:

- A Windows GUI program, intended for interactive use
- A DOS command-line program, intended for batch use

With minor exceptions, both programs offer the same functionality and performance.

### Windows GUI Program

The Windows GUI program can be used for both ad-hoc and repetitive tests and has features designed to quickly facilitate both:

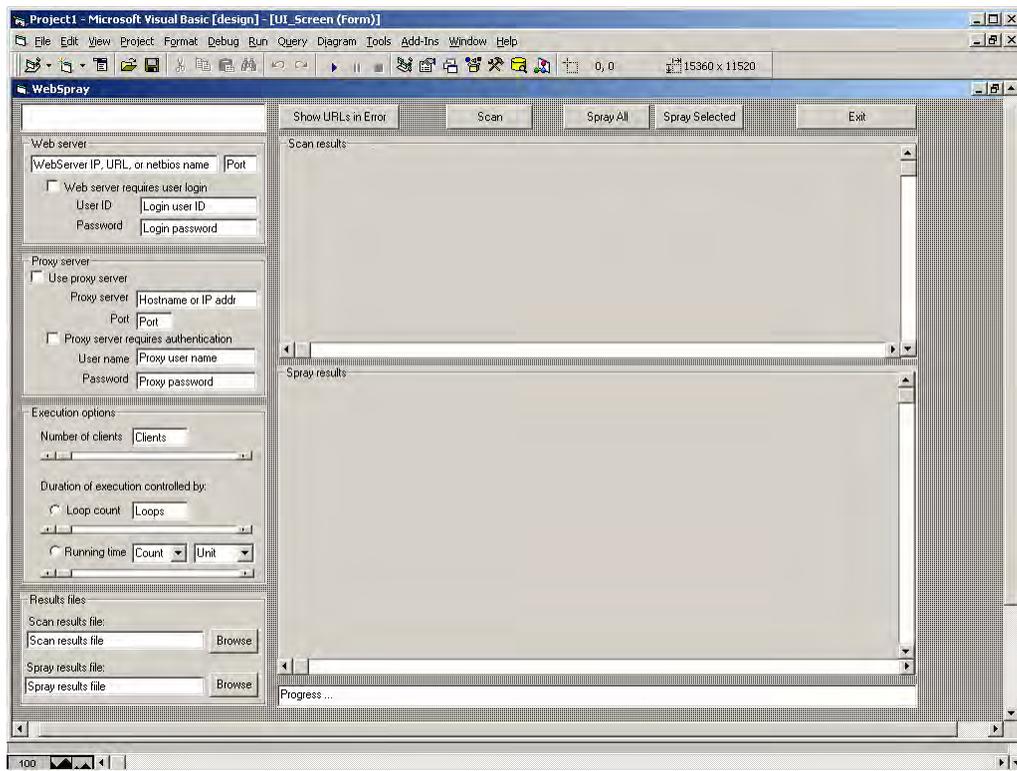
- The most popular configuration options and all execution options are available on the main screen to quickly and easily make changes
- Defaults for all configuration options can be easily set and reset as desired
- Named configuration profiles can be easily created to establish different testing profiles, and you can be easily switched between

### Command-Line Interface Program

The command-line interface program can be used to perform WebSpray operations in background mode. In the CLI program, all settings are declared explicitly via command switches.

## Windows GUI layout

The Windows GUI version main screen looks like this:



This interface contains the following elements:

- Configuration frames for specifying:
  - Web Server settings
  - Proxy Server settings
  - Execution Options
  - Results File names and locations
- Buttons for performing the following actions:
  - Scan qualifying pages to determine the URLs they contain
  - Show URLs in Error (e.g., broken links)
  - Spray All detected URLs
  - Spray Selected URLs only
  - Exit the program
- Scan Results pane
- Spray Results pane

- Progress bar to show execution progress
- Menubar with functions for:
  - Managing and selecting profiles
  - Configuring all options and setting defaults
  - Performing actions
  - Getting Help

All main-screen functions are also available from menu options.

## Windows GUI operation

The Windows GUI version is used in the following way:

- 1** Specify configuration settings (either explicitly or by loading a pre-set configuration profile)
- 2** Perform a scan based on the configuration settings
- 3** Perform a spray based on either all qualifying URLs or only specified URLs (selected via highlighting in the scan results pane)



# Configuring a Test using the Windows GUI Program

## Setting Configuration Options

The first step in performing any WebSpray test is to set the configuration options for the test. There are three ways to set configuration options:

- From the main screen
- From the Options menu
- From a configuration profile

These methods may be used alone or in combination.

The configuration options on the main screen are synchronized with those in the Options menu such that modifying either will have the same effect (and be automatically shown in both places).

You may also load a configuration profile and then override any of those settings from the main screen or the Options menu. You may then, if you wish, update the chosen configuration profile using the new settings, or create a new profile based on those settings.

---

**Note** You may reset the default configuration values at any time, and such new defaults will be imposed immediately and from then on.

---

## Configuration Profiles

Configuration profiles provide an easy means of creating various configuration environments and reusing those environments, rather than explicitly establishing the desired settings every time.

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**Note** To manage configuration profiles, use the Load Profile, Save Profile, and Delete Profile options from the File menu. You can either specify the path and filename of the file, or browse to the path by hitting the Browse button.

---

## Default Configuration Settings

WebSpray is supplied with factory default configuration settings that reflect typical values. You may wish to override these values and have your chosen values be imposed as new defaults. To do so, use the Save as Default button on the various screens from the Options menu.

---

**Note** If you override the factory default settings and save them as defaults, those factory settings are lost.

---

## Configuration Options

WebSpray Windows GUI configuration options specify the following:

- Web site to test, which port number to use, and login details if authentication for the Web server is required
- If the web site is specified by URL, whether pages matching the full URL or just the domain name should be qualified
- Whether links that point outside the web site (foreign links) should be followed
- If foreign links should be followed, for how many levels of depth should they be followed
- Proxy server and port to use, and login details if authentication for the proxy server is required
- Which IP addresses configured on the WebSpray PC should be used, for tests that require different source IP addresses
- Which browser to emulate
- Which protocol should be used (HTTP or HTTPS) when reading the head page of the web site
- Number of threads that should be used, for simulating simultaneous users
- Whether execution duration is controlled by loop count or running (wall) time and the number of iterations or running time, respectively
- Names and locations for WebSpray's scan and spray results files

The most popular of these options are accessible from the main screen; all options are available from the Options menu.

## Configuring Target Web Server

The Web Server is the target server that will be tested by WebSpray. You need to specify at least the URL or address of the server and, for servers that require authentication, the login information.

This option is available from the Web Server frame on the main screen. It is also available from the Target Web Server option of the Options menu:

The Web Server option has the following suboptions:

### Web server

This identifies the Web server to test. It can be specified in one of the following ways:

- The IP address of the Web server
- A URL that is resolved by an internal DNS server, or an external DNS server if the server is accessible via the Internet
- A name that can be resolved within an internal network, such as a netbios name

---

**Note** If you are using WebMux for load balancing multiple Web servers and want to use WebSpray against a WebMux server farm, enter the IP address configured for the farm.

---

If the Web server is specified by IP address or URL, it may be optionally prefixed with “HTTP” or “HTTPS” to specify the protocol to use for the head page. The head page protocol may alternately be specified using the Protocol for Head Page option. If no protocol is

specified, WebSpray will use HTTP protocol; if the server uses a secured (SSL) head page, you must specify HTTPS protocol. (This is the same behavior used by browsers.)

The Web server may optionally be suffixed by the port number on the Web server that WebSpray should use for its communication. If no port number is appended, it must be specified in the Port number field immediately following.

### **Port**

Enter the port number on the Web server to be tested that WebSpray should use for its communication. The default port is 80.

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**Note** This option is disabled if the port number was appended to the URL or IP address specified in the Web server box

---

### **Web server requires user login**

If the specified Web server requires a user login, tick this checkbox.

### **User ID**

Specify the user ID required for Web server access. Be sure to use the same case (upper versus lower) that the proxy server expects.

### **Password**

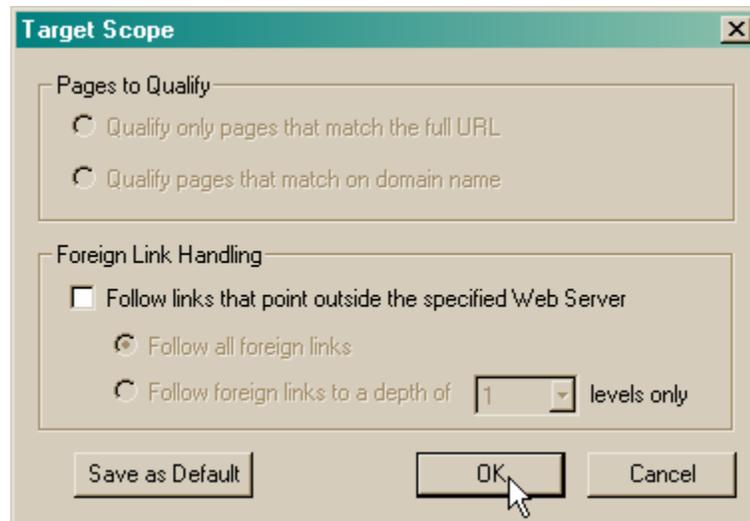
Specify the password associated with the User ID required for Web server access. Be sure to use the same case (upper versus lower) that the proxy server expects.

## **Configuring Target Scope**

This option determines which pages will be read in scan mode. You can restrict scanning to:

- Qualify only pages that match the full URL, if the Web server was specified by URL
- Qualify pages that match on the domain name
- Follow links that point outside of the specified Web server
- Follow all foreign links
- Follow links to a specified depth

To impose any of these restrictions, use the Target Scope option from the Options menu:



The Target Scope option has a number of parameters:

### Pages to Qualify

This option allows you restrict WebSpray from qualifying certain pages while scanning, for Web servers specified by URL.

Enable the radio button that corresponds to what pages you want WebSpray to qualify:

#### Qualify only pages that match the full URL

WebSpray will compare the URL of each page encountered against the URL specified for the Web server and qualify the page only if its URL contains the full URL specified for the Web server. This is the default case.

#### Qualify pages that match on domain name

WebSpray will compare the domain name portion of each page encountered against the domain name portion of the URL specified for the Web server and qualify the page only if its domain name matches the specified Web server's domain name.

---

**Note** This feature is disabled if the Web server is specified by IP address, netbios name, or other method

---

## Foreign Links Handling

By default, WebSpray does not follow any links that point outside of the specified Web server. Enabling this option will cause WebSpray to follow foreign links, and permits you to specify to what depth WebSpray should follow links on the foreign server.

### Follow links that point outside of the specified Web Server

Tick this checkbox if you want WebSpray to follow links that point outside of the specified Web server.

### Follow all links

Enable this radio button if you want WebSpray to follow all foreign links and the links on the pages they point to, including those that in turn point to other foreign servers. If this option is enabled, WebSpray will continue to follow all links on all pages encountered until all linked pages have been qualified.

### Follow foreign links to a dept of $n$ levels only

Enable this radio button if you want WebSpray to follow foreign links to a specified depth. If you enable this option, you need to specify the depth to which WebSpray will follow foreign links. The allowable range is 1 to 10. If, for example, you specify a value of 2, WebSpray will follow the first link to the foreign server and then all links contained on that page only.

## Configuring Client IP Addresses

Typically, testing a Web server using a single client IP address is sufficient but in some cases it may be desirable to have WebSpray use more than one client IP address for testing. For this reason, it is possible to configure WebSpray to use as many IP addresses as are configured on the WebSpray PC for testing. WebSpray will randomly alternate between these multiple IP addresses when spraying, thereby simulating the behavior of different client PCs.

This feature requires that the WebSpray PC be preconfigured with multiple IP addresses, which is a feature of the Windows operating system (refer to Appendix for instructions on how to accomplish that).

To configure multiple client IP addresses to be used by WebSpray, use the Client IP Addresses option from the Options menu:

[screen shot]

Each IP address assigned to the WebSpray PC is listed with a checkbox for each. Tick the checkbox for each IP address you want to include for WebSpray testing.

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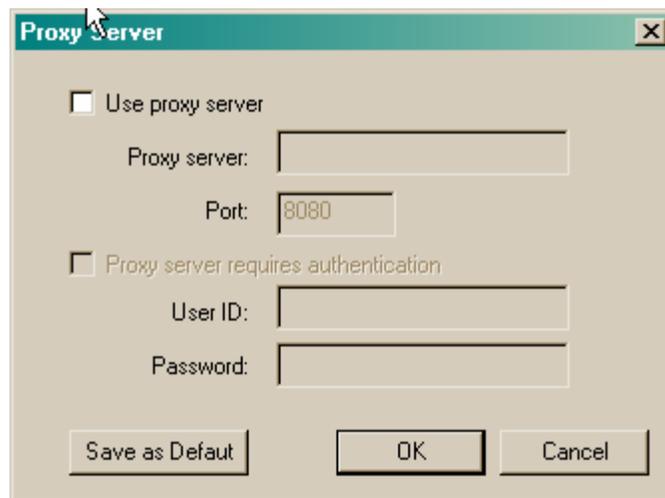
**Note** This option is disabled if there is only a single IP address assigned to the PC

---

## Configuring Proxy Server

This option is used to configure network access for WebSpray via a proxy server, if such is required.

This option is available from the Proxy Server frame on the main screen. It is also available from the Proxy Server option of the Options menu:



### Use Proxy Server

If your network requires you to use a proxy server to get access, tick this checkbox.

### Proxy Server

Specify the proxy server to use by specifying one of the following:

- The IP address of the proxy server
- A URL that is resolved by an internal DNS server, or an external DNS server when testing originates on the Internet
- A name that can be resolved from the internal network, such as a netbios name

### Port

Enter the port number on the proxy server. The default port is 8080.

### Proxy Server Requires Authentication

If the specified proxy server requires authentication, tick this checkbox.

### User name

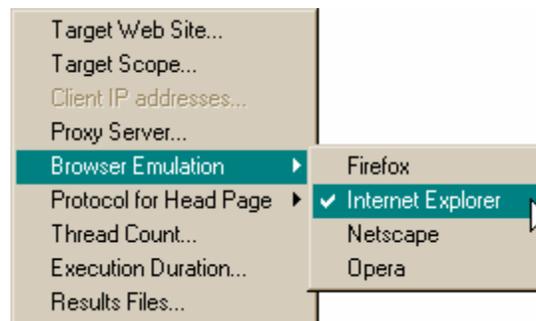
Specify the user ID required for proxy server access. Be sure to use the same case (upper versus lower) that the proxy server expects.

### Password

Specify the password associated with the User ID required for proxy server access. Be sure to use the same case (upper versus lower) that the proxy server expects.

## Configuring Browser Emulation

You may wish to perform WebSpray tests using different types of browsers. To do so, use this option, which is accessible via the Browser Emulation option on the Options menu:

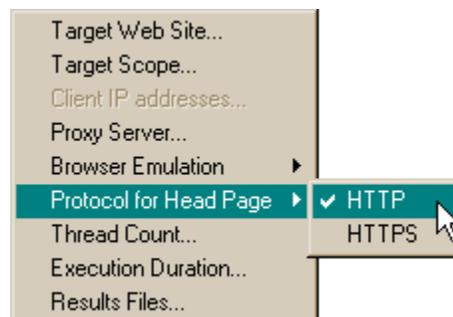


By default, WebSpray emulates Internet Explorer 5.5

## Configuring Protocol for Head Page

For tests against Web servers where the starting page (head page) is secured (meaning it requires an SSL connection), WebSpray must be told this in order to correctly process the site.

The protocol to use for the head page can be specified either using the Protocol for Head Page option or by prefixing the URL or IP address in the Web Server option with either “HTTP” or “HTTPS”. (If the URL is prefixed, the Protocol for Head Page option is disabled.)



If the protocol is not specified, HTTP is used.

---

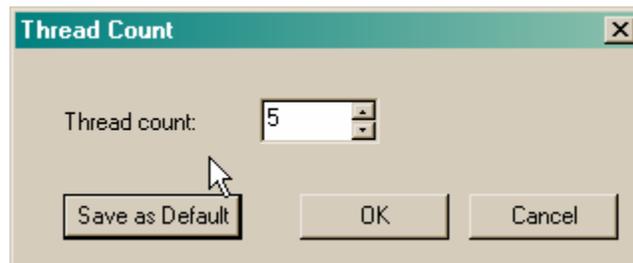
**Note** The configured protocol is only used for the head page. Correct specification of the head-page protocol is required since WebSpray (like browsers) is not able to tell which protocol to use. For pages beyond the head page, WebSpray is able to automatically determine the correct protocol to use and does so.

---

## Configuring Thread Count

This option is used to configure how many concurrent accesses should be made to the Web server, to simulate that number of users.

This option is accessible in the Execution Options frame on the main screen and the Thread Count option of the Options menu:



### Thread Count

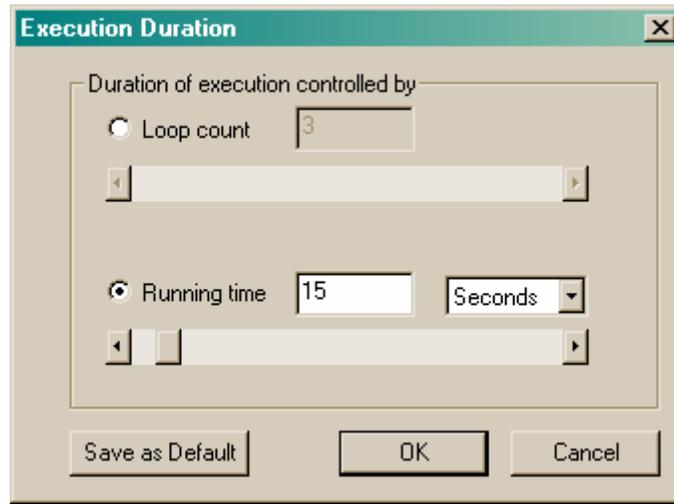
Specify the number of concurrent accesses that should be made. The range is 1 to 1000; the default is 15.

This value may alternately be set by moving the indicator on the slider bar to the left or right. As the indicator is moved to the left or right, the corresponding values are reflected in the box.

## Configuring Execution Duration

This option specifies how long a spray should run for, either by number of iterations or time. The spray will automatically terminate once this has been reached.

This option is accessible in the Execution Options frame on the main screen and the Execution Duration option of the Options menu:



If specified as a loop count, WebSpray will loop through the qualifying pages and spray each consecutively for the specified number of times.

If specified by duration, WebSpray will follow the same method as for loop count but stop when the time limit has been reached.

This option is accessible in the Execution Options frame on the main screen and the Execution Duration option of the Options menu.

### Loop Count

Specify the number of times WebSpray should spray qualifying URLs. The range is 1 to 1000; the default is 1.

To adjust the value, first enable this option by clicking on the radio button next to it, then enter a numeric value into the box.

This value may alternately be set by moving the indicator on the slider bar to the left or right. As the indicator is moved to the left or right, the corresponding values are reflected in the box.

### Running Time

Specify how long the spray is to run, either in seconds, minutes, hours, or days. The default is 15 seconds; the maximum is 7 days.

To adjust the value, first enable this option by clicking on the radio button next to it, then enter a new numeric value in the first drop-down box and select the time measurement from the second drop-down box.

These values may alternately be set by moving the indicator on the slider bar to the left or right. The slider is divided into fourths, where the first increment represents seconds, the second minutes, the third hours, and the fourth days. As the indicator is moved to the left or right, the corresponding values are reflected in the boxes.

---

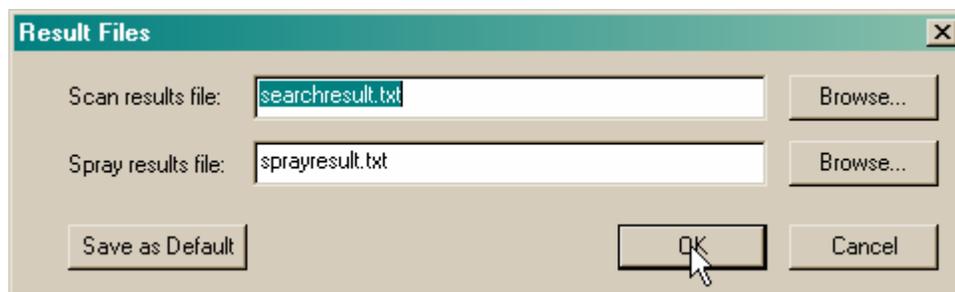
**Note** If you attempt to specify more than the maximum duration of 7 days, the boxes are automatically adjusted to the maximum allowable duration

---

## Configuring Results Files

Once a scan or spray has completed, the results are displayed on the main screen and also written to two files. This option is used to override the default filenames and/or locations for these files.

This option is accessible from the Result Files frame on the main screen and the Results Files option on the Options menu:



### Scan Results File

Specify the path and filename where the results of the scan are to be stored, or browse to the path by hitting the Browse button.

The scan results file is by default named ScanResult.txt and located in the \Reports subdirectory of the WebSpray installation directory, which is by default \Program Files\CAI Networks\WebSpray.

### Spray Results File

Enter the path and filename where the results of the stress test are to be stored, or browse to the path by hitting the Browse button.

The spray results file is by default named SprayResult.txt and located in the \Reports subdirectory of the WebSpray installation directory, which is by default \Program Files\CAI Networks\WebSpray.



---

# Testing with the GUI Program

## Overview

Testing a Web server via the WebSpray GUI program is a two-stage process:

- Scan the Web server for qualifying pages via the Scan option
- Spray qualifying or selected pages

The scan information is saved, permitting you to perform multiple sprays based on the same scan result. In addition, each spray can be configured to automatically perform multiple iterations based on configuration settings.

WebSpray also supports configuration profiles, allowing you to save current configuration settings for re-use at a later time. This is particularly useful if you want to use different configuration settings for different tests and do not want to specify them each time.

## WebSpray Actions

WebSpray actions accomplish the following:

- Scan for qualifying pages
- Show URLs in error
- Spray all qualifying pages
- Spray selected (qualifying) pages
- Exit the program
- Get help
- Display WebSpray Version
- Display WebSpray Licensing Information

The most popular of these actions are accessible from the main screen; all actions are available from the File, Actions, or Help menus.

## Scan for Qualifying Pages

To scan the specified Web server for all accessible URLs based on the current configuration settings, hit the Scan button on the main screen or use the Scan option from the Actions menu.

WebSpray will scan all qualifying pages and show all URLs found in the scan results pane and in the specified scan results file. Any URLs that have returned errors, due to broken links or other problems, are shown. During scanning, the progress bar is dynamically updated to show the progress of the scan.

Once the scan is complete, you can show URLs in error or proceed to spray the “good” URLs.

## Show URLs in Error

The Show URLs in Error button is enabled if any URLs found in scan have returned errors, due to broken links or other problems. Hit this button to display those URLs, or use the same-named option from the Actions menu.

## Spray All Qualifying Pages

To start the test so that it will access all the URLs found in the scan (except those in error), hit the Spray All button or use the same-named option from the Actions menu.

During spraying, the progress bar is dynamically updated showing the progress of the spray.

When the test is complete, the results are shown in the Spray results pane. These same results are written to the file specified as the spray results file.

---

**Note** You must perform a scan before you can spray. The Spray All button on the main screen and the Spray All option of the Actions menu are disabled if a scan has not been performed

---

## Spray Selected Pages

To test only certain URLs for spraying:

- First select the desired URLs from the list that appears in scan results pane by clicking on them, which will highlight them. You can select multiple entries by Ctrl-click (for non-contiguous entries) or Shift-click (for contiguous entries)
- Then hit the Spray Selected button to start spraying or use the same-named option from the Actions menu.

During spraying, the progress bar is dynamically updated showing the progress of the spray.

When the test is complete, the results are shown in the Spray results pane. These same results are written to the file specified as the spray results file.

---

**Note** You must perform a scan before you can spray. The Spray Selected button on the main screen and the Spray Selected option of the Actions menu are disabled if a scan has not been performed. These features are also disabled if a scan has been performed but no URLs have been selected

---

## Exit the Program

To exit the WebSpray Windows GUI program, hit the Exit button on the main screen or use the Exit option from the File menu. If there is a scan or spray in process when you attempt to exit the program, WebSpray will confirm that you really want to exit.

---

**Note** If exiting the program and you have loaded a configuration profile and modified any of the settings without saving the profile, you will be prompted as to whether or not to update the profile based on the current settings

---

## Get Help

To access WebSpray's help file, use the WebSpray Help option from the Help menu.

## Display WebSpray Version

To display version information of the installed WebSpray release, use the About WebSpray option from the Help menu.

## Display WebSpray Licensing Information

To display licensing information of the installed WebSpray release, use the About WebSpray option from the Help menu. For trial versions, the number of days remaining in the trial period is shown; for licensed versions, the name of the licensee is shown.



---

# Using the Command Line Interface

## Introduction

Like the Windows GUI program, which separates scanning and spraying into two distinct phases, the command-line-interface program, `wspray.exe`, also requires two separate command operations to scan and spray.

With the command-line-interface program, you first use the scan command option to create a file containing qualifying URLs, followed by the spray command option to refer to the URL file created by the scan. Command switches are used to specify various options for spray and scan. Results can be found in results files created by the scan and spray.

## Configuration and Run Options

WebSpray command-line-interface program configuration options specify the following:

- Web site to test, which port number to use, and login details if authentication for the Web server is required
- If the web site is specified by URL, whether pages matching the full URL or just the domain name should be qualified
- Whether links that point outside the web site (foreign links) should be followed
- If foreign links should be followed, for how many levels of depth should they be followed
- Proxy server and port to use, and login details if authentication for the proxy server is required
- Which protocol should be used (HTTP or HTTPS) when reading the head page of the web site
- Number of threads that should be used, for simulating simultaneous users
- Whether execution duration is controlled by loop count or running (wall) time, and the number of iterations or running time, respectively
- Whether a scan or spray is to be performed

- Names and locations for WebSpray's scan and spray results files

## Invoking the Command-Line-Interface Program

The command line interface program (CLI) is named `wspray.exe` and is located in the directory in which WebSpray was installed.

You must run the CLI either from Start | Run ... or from within a DOS box.

A quick method of getting an open DOS box in the WebSpray installation directory is provided from the Windows Start menu via CAI Networks | WebSpray | WebSpray command line:



Invoking that feature does the following:

- Opens a DOS box
- Changes directory to the WebSpray installation directory
- Displays the command-line-interface program's help screen

You can then run the CLI from the installation directory and specify its options.

## Command Syntax

WebSpray command-line-interface program (CLI) commands are specified positionally and via command switches. Scan and spray commands share some common options and are differentiated by the inclusion of the "scan" or "spray" token on the command line.

The `wspray` CLI command has two forms:

```
wspray.exe scan-options [general-options] scan scan-result-file
wspray.exe spray-options [general-options] spray spray-result-file
```

where

**scan-options** are:

<code>-s server</code>	Web server to test
<code>-p port</code>	Web server port to use
<code>-S</code>	Use HTTPS protocol for head page

-U <i>[protocol://]url[:port]</i>	URL of start page for testing and optionally protocol to use for head page and Web server port to use (overrides -s, -p, and -S options)
-d	Qualify only pages whose domain name matches the specified Web server domain
-fd <i>[depth]</i>	Traverse foreign links to a specified number of levels
<b><i>scan-result-file</i></b>	Pathname of file in which to write scan results
<b><i>spray-options</i></b> are:	
-sf <i>scan-file</i>	Specifies file containing URLs to spray
-th <i>thread-count</i>	Number of threads to use when spraying
-l <i>loop-count</i>	Number of times to spray the URLs (cannot be specified with -th)
-t <i>duration increment</i>	Running time for spray (cannot be specified with -l)
<b><i>spray-result-file</i></b>	Pathname of file in which to write spray results
<b><i>general-options</i></b> are:	
-u <i>username password</i>	User name and password to use for Web server login
-P <i>proxy-server</i>	Hostname or IP address of proxy server
-Pp <i>proxy-server-port</i>	Port number on the proxy server to use
-Pu <i>username password</i>	User name and password to use for proxy server login
-B <i>browser</i>	Browser type to emulate
-IP <i>addr1, ..., addrN</i>	List of IP addresses to connect from

---

**Note** WebSpray command options (switches) are case-sensitive

---

## Command options

The following paragraphs detail the WebSpray CLI command options, parameters, and usage by function. They are grouped by below into scan options, spray options, and general options.

## Scan Options

Scan options are used when scanning and are only imposed when the “scan” token is included in the wspray command.

## Specifying Target Web Server

The target Web server that will be tested by WebSpray is a required option and may be specified either by the IP address or host name of the Web server or the URL of the page to start with. (The discussion herein is for specifying the Web server via IP address or host name; for specification by URL, refer to the discussion in the next section.)

If the Web server requires authentication, the login information must be specified (via the `-u` option).

### Web server

The `-s` option specifies the Web server to test. It can be specified either by URL or IP address.

The format of this command option is:

```
-s server
```

where *server* is either the IP address or host name of the Web server to test.

### Port

The `-p` option specifies the remote port to use (on the specified Web server). If the `-p` option is not specified, the CLI will use port 80 for HTTP protocol and port 443 for HTTPS protocol.

The format of this command option is:

```
-p port
```

where *port* is the port number to use on the specified Web server.

### Protocol

By default, WebSpray imposes HTTP protocol for the starting (head) page on the specified Web server. If the starting page requires the use of HTTPS protocol, use the `-S` option.

The format of this command option is:

```
-S
```

If the `-S` option is not specified, HTTP protocol is used for the starting page.

---

**Note** The target Web server may also be specified via the `-U` option, which specifies the URL of the starting page and optionally the Web server port number to use and protocol to use for the head page.

---

## Specifying Starting Page by URL

The target Web server that will be tested by WebSpray is a required option and may be specified either by the URL of the page to start with or the IP address or host name of the Web server to test. (The discussion herein is for specifying the Web server via URL; for specification by IP address or host name, refer to the discussion in the previous section.)

If the Web server requires authentication, the login information must be specified (via the `-u` option).

The `-U` option specifies the URL of the starting page to use when scanning, and optionally the protocol to use for the head page and remote port to use.

The protocol to use when accessing the head page may optionally be specified by pre-pending it to the URL or IP address. If the protocol is not specified, HTTP protocol is used; if the head page is secure, you must specify that by pre-pending the URL with “HTTPS://”.

The remote port (on the Web server) may optionally be specified by port number. If the remote port is not specified, WebSpray will use port 80 for HTTP protocol and port 443 for HTTPS protocol.

The format of this command option is:

```
-U [protocol://]url[:port]
```

where

*protocol* is optional and is either “HTTP” or “HTTPS”

*url* is required and either a URL or IP address

*port* is optional and an integer value defining the port number of the Web server to use

## Specifying Scope of Pages to Test

There are two command options, `-d` and `-fd`, that can be used to override the default scope of pages that wspray will qualify when scanning.

By default, wspray will qualify only pages whose URLs match the full URL of the starting page. The `-d` option instructs wspray to relax the URL match and qualify any pages encountered that are within the domain as the starting page.

Also by default, wspray will not follow any links that point outside of the Web server being tested. Wspray can be instructed to follow external links – either all foreign links or only to a specified depth.

### Match on Domain Name

The `-d` option instructs `wspray` to qualify any pages encountered that are within the same domain as the Web server, regardless of whether their URLs match that of the starting page.

The format of this command option is:

`-d`

If the `-d` option is not specified, only pages whose URLs match that of the starting page are qualified.

### Follow Foreign Links (All or to a Specified Depth)

The `-fd` option instructs `wspray` to follow links that point outside of the specified Web server and, optionally, the depth to which they should be followed.

The format of this command option is:

`-fd [depth]`

where *depth* specifies the number of levels of foreign links WebSpray should read, in a range of 1 to 10. If *depth* is not specified, all foreign links are read.

If the `-fd` option is not specified, links that point outside of the current Web server are not followed.

### Specifying Scan Result File

Upon completion of a scan operation, `wspray` generates a file that contains a list of all the URLs encountered with result information about each. This file serves two purposes:

- It reveals the results of the scan and shows URLs in error
- It is used as input for spray operations

The scan-result-file is required and is specified as the last parameter on a scan command. It may be qualified with a path; otherwise, it is created in the current working directory.

## Spray Options

Spray options are used when spraying and are only imposed when the “spray” token is included in the `wspray` command.

## Specifying Scan Result File (to Govern Spray)

When spraying, you must point `wspray` to the file that contains the URLs collected during scan. This is done using the `-sf` option, a required command option when spraying.

The format of this command option is:

```
-sf scan-result-file
```

where *scan-result-file* is the pathname of the scan result file. If the `scan-result-file` is located in the current working directory, it can be specified by file name; otherwise, its full or relative pathname must be specified.

## Specifying Thread Count

The `-th` command option is used for specifying how many concurrent accesses should be made to the Web server, to simulate that number of users. If the `-th` option is not specified, `wspray` will use the default of 5 threads.

The format of this command option is:

```
-th thread-count
```

where *thread-count* is an integer value between 1 and 1000.

## Specifying Execution Duration

Execution duration for spraying can be specified either by the amount of time or number of consecutive times the spray should be executed (using the same scan-file), using either the `-t` or `-l` command option.

When spraying, either `-t` or `-l` must be specified to instruct WebSpray how long to spray for.

---

**Note** The `-t` and `-l` options are mutually exclusive: only one or the other may be specified

---

## Specifying Execution Duration by Loop Count

The `-l` option specifies how many times the spray should run consecutively. WebSpray will stop once it has cycled through the URL list the specified number of times and report the results.

The format of this command option is:

```
-l loop-count
```

where *loop-count* is an integer value between 1 and 1000.

## Specifying Execution Duration by Running Time

The `-t` option specifies how long a spray should run for. WebSpray will stop once the time limit has been reached and report the results.

The format of this command option is:

```
-t duration increment
```

where *duration* is an integer value which in combination with *increment* parameter may not exceed the equivalent of 10,000 minutes

and *increment* is one of:

<code>sec</code>	Seconds
<code>min</code>	Minutes
<code>hour</code>	Hours
<code>day</code>	Days

## Specifying Spray Result File

Upon completion of a spray operation, `wspray` generates a file that contains a report revealing the results of the spray operation.

The *spray-result-file* is specified as the last parameter on a spray command. It may be qualified with a path; otherwise, it is created in the current working directory.

If the “spray” token is included in the command line but no *spray-result-file* is specified, the spray results are written to `SprayResult.txt` located in the `\Reports` subdirectory of the WebSpray installation directory.

## General Options

General options are used when scanning or spraying and are imposed in all CLI operations (i.e., when either the “scan” or “spray” token is included in the `wspray` command).

## Specifying Web Server Login

If the target Web server requires user authentication, the login information must be specified via the `-u` option.

The format of this command option is:

```
-u username password
```

where

*username* is the case-sensitive user name for Web server login

*password* is the case-sensitive password for Web server login

## Specifying Proxy Server

If a proxy server is required for WebSpray to get network access, it must be specified along with login information if authentication is required. This is specified using multiple command options.

### Proxy server

The `-P` option specifies the proxy server to use. It can be specified either by hostname or IP address.

The format of this command option is:

`-P proxy-server`

where *proxy-server* is either a hostname or IP address.

### Proxy Server Port

The `-Pp` option specifies the port number on the proxy server to use.

The format of this command option is:

`-Pp proxy-server-port`

where *proxy-server-port* is an integer value that specifies the port of the proxy server wspray will use.

If the `-p` option is used to specify a proxy server but the `-Pp` option is excluded, port 8080 will be used.

### Proxy Server Login

The `-Pu` option specifies the user ID and password for logging into the proxy server. This option is not required if the proxy does not require authentication.

The format of this command option is:

`-Pu username password`

where

*username* is the case-sensitive user name for proxy server login

*password* is the case-sensitive password for proxy server login

## Specifying Browser to Emulate

Wspray is capable of emulating popular browsers. By default, it emulates Internet Explorer but you may specify a different browser to emulate via the `-B` option.

The format of this command option is:

`-B browser`

where *browser* is one of:

Firefox	Firefox version 1.0.3
IE	Internet Explorer version 6.0
Netscape	Netscape version 4.8
Opera	Opera version 8.0

If this command option is not specified, `wspray` will emulate Internet Explorer version 6.0.

## Specifying Multiple IP Addresses

By default, WebSpray will connect using the IP address assigned to the WebSpray PC. If more than one IP address is assigned to the WebSpray PC, it is necessary to tell WebSpray which one(s) to use for testing. This is done via the `-IP` command option.

The format of this command option is:

`-IP addr1,...,addrN`

where either a single IP address is specified, or multiple IP addresses are specified delimited by commas.

If multiple IP addresses are assigned to the WebSpray PC and the `-IP` command option is not specified, WebSpray will use the primary IP address.

## Examples

These commands scan a bank's web site using https protocol for the head page and sprays it for five minutes using 10 threads:

```
wspray -U https://www.bankofthewest.com/ scan bow_scan.txt
wspray -sf bow_scan.txt -t=5 -th=10 spray bow_spray.txt
```

This command scans the same site but follows links to a depth of 2 levels on foreign sites linked to from the specified Web server:

```
wspray -U https://www.bankofthewest.com/ -fd 2 scan bow_scan.txt  
wspray -sf bow_scan.txt -t=5 -th=10 spray bow_spray.txt
```



# Sample Tests

## Testing examples

This chapter contains some examples of common tests that are performed with WebSpray.

### Simple Out-of-the-Box Test

WebSpray has default values set for most configuration settings so to perform a quick test you only need to specify the target Web server (either by host name or IP address) and then perform the scan and spray operations.

► **To configure an out-of-the-box test**

- 1 Specify the IP address or host name of the Web server in ‘Web server’ box
- 2 Hit the Scan button
- 3 When the scan is complete, hit the Spray All button

This will test all qualifying pages on the specified Web server using default settings and report the results in the Scan Result window and Spray Result window

### Testing a Server Multiple Times

By default, WebSpray will spray all selected pages one time. While this is usually sufficient to provide representative results, factors such as connection speed variations, network traffic, site loading, etc. can skew results. Therefore, WebSpray makes it easy to test a web site multiple times in sequence. To do that, set ‘Loop count’ to the desired number of iterations.

Alternately, WebSpray can limit the amount of time a spray will run. If it has not sprayed all web pages before the time limit, it will report results for whatever pages it has sprayed, which should be indicative of the overall Web server performance. If you want WebSpray to keep running until all pages have been sprayed, specify a high value for the ‘Running time’ option.

▶ **To test a Web server multiple times in sequence**

- 1 Enable the 'Loop count' option by ticking its radio button
- 2 Specify desired 'Loop count', either by entering it using the edit and listbox or via the slider beneath
- 3 Scan and Spray

▶ **To test a Web server over specified time period**

- 1 Enable the 'Running time' option by ticking its radio button
- 2 Specify the running time value in the edit box and select increments using the listbox, or use the slider beneath
- 3 Scan and Spray

## Controlling Transaction Volume for Testing

WebSpray lets you control the transaction volume used for testing by increasing or decreasing the number of threads used in testing, where the more threads that are used the higher the transaction volume. This has the effect of simulating multiple users, since each thread runs independently and generates near-simultaneous transactions to the Web server.

---

**Note** Increasing the thread count puts an extra burden on system resources on the WebSpray PC. You may find that control of the PC may become sluggish if insufficient resources are available to service a high number of threads. Should that happen, you would either need to decrease the number of threads or upgrade the WebSpray PC, or both.

---

▶ **To increase the thread count used when spraying**

- 1 Type in the desired 'Thread count' or use the up or down arrow to change the value
- 2 Scan and spray

## Testing Selected Pages Only

You can limit the pages on the Web server that are tested by selecting only certain URLs from the scan result. (Alternately, you can scan all pages qualified by the scan).

▶ **To spray selected pages only**

- 1 Perform a scan

- 2 Select the URLs you want to spray by highlighting each one in the Scan Result pane
- 3 Hit the Spray Selected button

## Testing Foreign Pages that are Linked from the Tested Server

By default, WebSpray tests only pages on the specified server; but it is also possible for WebSpray to test links that point outside of the specified Web server and to follow those to a specified depth.

### ▶ To follow foreign links and test foreign pages

- 1 Select Target Scope from the Options menu
- 2 Enable the 'Follow links that point outside the specified Web Server' option by ticking its checkbox
- 3 Enable either radio button, to follow all foreign links (to infinite depth) or specify the depth to which foreign links should be followed
- 4 Scan and spray

## Testing Via a Proxy Server

If network access from the WebSpray PC is required to go through a proxy server, you will need to configure the proxy server for WebSpray usage. If the proxy authenticates, you will need to provide the information for that.

### ▶ To configure a proxy server for WebSpray usage

- 1 Enable the 'Proxy Server' option by ticking its checkbox
- 2 Specify the hostname or IP address of the proxy server
- 3 Specify the port on which the proxy server communicates (the default is usually fine)
- 4 If the proxy server requires authentication, enable the 'Proxy server requires authentication' option by ticking its checkbox
- 5 Specify the user ID to login to the proxy server
- 6 Specify the password for the user ID specified (may or may not be case-sensitive, depending on the proxy server)
- 7 If WebSpray normally accesses via the configured proxy server, you may wish to create a profile with the proxy server information and use it every time you run WebSpray.

## Testing Using Multiple IP Addresses

By default, WebSpray tests only pages on the specified server; but it is also possible for WebSpray to test links that point outside of the specified Web server and to follow those to a specified depth.

### ▶ To select IP addresses for WebSpray to use

- 1 Select the 'Client IP addresses...' option from the Options menu. (Note that this option is greyed if there is only a single IP address configured for the WebSpray PC.)
- 2 Enable the IP addresses you want to use by ticking their checkboxes
- 3 If you plan to use multiple IP addresses each time you run WebSpray, you may want to configure a profile for that and use it each time you run WebSpray. If you want to alternate between different IP address configurations, you may want to set multiple profiles and alternate between them.
- 4 Scan and spray

## Testing a WebMux “Web Farm”

If you have a WebMux web farm, in which multiple web servers are represented by a single IP address (the IP address of the WebMux appliance), you perform a normal WebSpray test with some recommended settings.

### ▶ To test a WebMux web farm it is recommended that you

- 1 Specify multiple IP addresses for the WebSpray server.
- 2 Increase the number of threads used when testing (since you are actually testing multiple web servers simultaneously)
- 3 Scan and spray

# Reporting

## WebSpray reporting

Upon completion of a scan or spray operation, a resulting report is displayed in the corresponding pane on the main screen. A copy of the report is also saved to a file for printing or for later reference.

### Scan Results

Upon completion of a scan operation, a scan results report is displayed in the scan results pane on the main screen and a copy of the report is saved to a file. The scan results file contains a list of all the accessible URLs on the specified Web server.

The scan results report contains one entry for each qualifying page with related information. URLs in error are also shown.

### Scan Results Pane

Upon completion of a scan, the Scan Results Pane reports summary results of the scan in a structured format, like this:

URL	Code	Text	Type	Size	
http://www.prevalance.com/	200	OK	text/html	4097	
http://www.prevalance.com/css/font.css	200	OK	text/css	648	
http://www.prevalance.com/img/spacer.gif	200	OK	image/gif	43	
http://www.prevalance.com/img/head7.jpg	200	OK	image/jpeg	4252	
http://www.prevalance.com/img/icon1.jpg	200	OK	image/jpeg	4585	
http://www.prevalance.com/img/icon7.jpg	200	OK	image/jpeg	2890	
http://www.prevalance.com/img/icon9.jpg	200	OK	image/jpeg	4026	
http://www.prevalance.com/img/icon6.jpg	200	OK	image/jpeg	3758	



The Spray Results report is divided into four sections:

- The **header** section shows the basic statistics related to the report.
- The **Downloaded Data** section reports information about the volume of data tested content, and total.
- The **Average Time** section reports the timing statistics for the data tested.
- The **Throughput** result reports the overall data throughput achieved in the spray.

A detailed explanation of the report is below; how to interpret the report is described in the next section.

### Header

The header section shows the basic statistics related to the report and includes:

<b>Duration</b>	Total amount of (wall) time that the spray ran
<b>Clients</b>	The number of Threads that were used for the spray
<b>Loops</b>	The number of iterations that were completed in the spray (as governed either by Loop Count or Running Time)
<b>Good Pages</b>	The number of pages that were included in the spray (no errors were found by scan)
<b>Bad Pages</b>	The number of pages that were excluded from the spray (errors were found by scan)
<b>SSL</b>	The percentage of pages sprayed that use HTTPS (Secure Socket Layer) protocol -- the remaining pages use HTTP protocol

### Downloaded Data

The Downloaded Data section reports information about the volume of data tested, with minimum, maximum, and average volume shown separately for header content, body content, and total.

<b>Headers</b>	The volume of header data, in megabytes, that was read in the spray, as well as the percentage of data that was comprised by headers
<b>Body</b>	The volume of body data, in megabytes, that was read in the spray, as well as the percentage of data that was comprised by body content

**Total** The total volume of both header and body, in megabytes, that was read in the spray

### Average Time

The Average Time section reports the timing statistics for the data tested, with minimum, maximum, and average volume shown for connection and download time, averaged across all data read.

**Connection** The amount of time, in milliseconds, that the connection took to complete. These statistics reflect the so-called TTFB (Time To First Byte), which is the amount of time that it took from the start of the connection request until the first byte of the page was read

**Download** The amount of time, in milliseconds, that the download of all data on the page took to complete. These statistics reflect the so-called TTLB (Time To Last Byte), which is the amount of time it took from the start of the connection request until the last byte of the page was read.

### Throughput

The Throughput section reports the overall data throughput achieved in the spray, with minimum, maximum, and average.

**Throughput** The data throughput rate, expressed as the number of bytes per second.

The information shown reflects all pages tested. Separate statistics are shown for the page having the least volume of data or taking the least amount of time (minimum), the most volume or time (maximum), the mean of all pages (average), and the standard deviation of results across all pages tested.

### Spray Results File

The same information shown in the spray results pane is written to the spray results file.

The spray results file is by default named SprayResult.txt and located in the \Reports subdirectory of the WebSpray installation directory, which is by default \Program Files\WebSpray.

## Interpreting the Spray Report

The Spray Report provides valuable information for determining whether the Web server you are testing is performing up to expectations, and helps reveal where problem areas may exist.

Here are some things to look for in interpreting the report:

- A high ratio of header data to body data could indicate that performance gains could be achieved by reducing the header space.
- A high connection time could indicate that the Web server is too busy to quickly service connections or that the connection between the WebSpray PC and the Web server being tested is slow.
- Extreme disparities between minimum, maximum, and average timings, as indicated by standard deviation, could indicate erratic Web server performance.



# Glossary

This appendix contains terms used in this manual that the reader may not be familiar with and provides a definition of each.

<b>.wsp</b>	WebSpray profile file
<b>Broken link</b>	A link on a web page that points to a nonexistent page
<b>Domain name</b>	The name of a network domain, in the format domainname.extension
<b>Foreign link</b>	A link on a web page that points outside the current domain.
<b>Head page</b>	The first page WebSpray accesses on a Web server
<b>HTTP</b>	Traditional HTTP protocol
<b>HTTPS</b>	Secured HTTP protocol
<b>License Key</b>	A code supplied by CAI Networks, Inc. for converting a trial version of WebSpray into a licensed version
<b>Pane</b>	A windowed section of a screen. WebSpray's main screen contains a scan results pane and a spray results pane
<b>Proxy server</b>	A server through which TCP/IP traffic may pass for the purpose of providing caching, secured access, and other benefits
<b>Scan</b>	A WebSpray operation in which pages on a specified Web server are read and the links they contain are detected and extracted as URLs
<b>Serial number</b>	A unique ID assigned to each installed copy of WebSpray, used for identification and licensing purposes
<b>Spray</b>	A WebSpray operation in which web pages identified in a scan operation are read and the statistical results tabulated
<b>SSL</b>	Secured Sockets Layer protocol, which encrypts data before transmission and decrypts it after transmission using a supplied certificate

**URL**

Unified Record Locator, which is a specially-formatted name used to uniquely identify web pages

## Appendix B

# Windows Program Menu and Command-line Program Reference

## Windows Program Menu

The following menus and options are available from the Windows GUI menubar.

<b>File Menu</b>	
<b>Load Profile</b>	Loads specified configuration profile
<b>Save Profile</b>	Saves current new or existing configuration profile
<b>Delete Profile</b>	Deletes specified configuration profile
<b>Exit</b>	Terminates the program

<b>Options Menu</b>	
<b>Target Web Server</b>	Specifies Web server to test with optional port to use and login info
<b>Target Scope</b>	Specifies pages to include and exclude from scan
<b>Client IP Addresses</b>	Specifies client IP addresses to use when testing
<b>Proxy Server</b>	Specifies proxy server for network access with optional login info
<b>Browser Emulation</b>	Specifies browser for WebSpray to emulate
<b>Protocol for Head Page</b>	Specifies protocol to be used for reading Web server head page
<b>Thread Count</b>	Specifies number of concurrent threads for testing
<b>Execution Duration</b>	Specifies loop count or running time for spray execution
<b>Results Files</b>	Specifies names and locations of results files

<b>Actions Menu</b>	
<b>Scan</b>	Scans specified Web server and identifies all qualifying

	pages
<b>Show URLs in Error</b>	Lists URLs in error found during scan
<b>Spray All</b>	Sprays all qualifying pages
<b>Spray Selected</b>	Sprays specified pages

<b>Help Menu</b>	
<b>WebSpray Help</b>	Accesses WebSpray documentation
<b>About WebSpray</b>	Shows program version and licensing information

## Command-Line Program Switches and Parameters

The following command switches and parameters can be specified for the command-line-interface program:

<b>Scan Options</b>	
<b>-s server</b>	Specifies Web server to test
<b>-p port</b>	Specifies Web server port to use
<b>-S</b>	Causes wpspray to use HTTPS protocol for reading Web server head page
<b>-U [protocol://] url[:port]</b>	Specifies URL of start page for testing and optionally protocol to use for head page and Web server port to use
<b>-d</b>	Causes wpspray to qualify only pages whose domain name matches the specified Web server domain
<b>-fd [depth]</b>	Causes wpspray to traverse foreign links to a specified number of levels
<b>scan-result-file</b>	Specifies pathname of file in which to write scan results

<b>Spray Options</b>	
<b>-sf scan-file</b>	Specifies file containing URLs to spray
<b>-th thread-count</b>	Specifies number of threads to use when spraying
<b>-l loop-count</b>	Specifies number of times to spray the URLs
<b>-t duration increment</b>	Specifies running time for spray
<b>spray-result-file</b>	Specifies pathname of file in which to write spray results

<b>General Options</b>	
<b>-u</b> <i>username password</i>	Specifies user name and password for Web server login
<b>-P</b> <i>proxy-server</i>	Specifies hostname or IP address of proxy server
<b>-Pp</b> <i>proxy-server-port</i>	Specifies port number on the proxy server to use
<b>-Pu</b> <i>username password</i>	Specifies user name and password to use for proxy server login
<b>-B</b> <i>browser</i>	Specifies browser type to emulate
<b>-IP</b> <i>addr1, ..., addrN</i>	Specifies IP addresses to use, for WebSpray PCs that have more than one IP address assigned



## Frequently Asked Questions

**Q.** Can I stress test my server from an external network?

**A.** Yes. As long as the server can be reached from that network.

**Q.** Can I test with multiple workstations at the same time?

**A.** Yes. You can use multiple workstations, each configured with one or more clients.

**Q.** Can I test multiple servers simultaneously?

**A.** The only way to test multiple servers is if they belong to a Web server farm where a load balancer distributes the traffic. The IP address of the “Web Server” would be the IP address of the web farm.



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# Testing with multiple IP addresses

## Overview

WebSpray is capable of generating a high volume of transactions when run from a single PC. By default, WebSpray running on a single PC will use a single IP address and simulate multiple clients by using multiple threads in parallel.

To create a more realistic user environment, where each user has a different IP address, you may want to use one of the following methods to accomplish that:

- Assign multiple IP addresses to a single WebSpray PC having a single network adapter (“local multihoming”)
- Assign multiple IP addresses to a single WebSpray PC having multiple network adapters (“physical multihoming”)
- Use multiple WebSpray PCs, each having one or more network adapters and/or assigned multiple IP addresses (“physical multihoming” and/or “logical multihoming”)

## Configuring WebSpray PC for Logical Multihoming

WebSpray is capable of simulating multiple users by using multiple threads, as configured via the Number of Threads option. By default, all such clients reflect the same IP address: the IP address of the PC on which WebSpray is running on. This is normally sufficient for most testing scenarios.

There may be cases, however, in which you would like WebSpray to use different IP addresses for different clients. To do so, you must configure multiple IP addresses on the WebSpray PC and enable them for use by WebSpray via the Client IP Addresses option. Once this is done, WebSpray will randomly use all enabled IP addresses when testing.

Windows allows multiple IP addresses to be configured for a single network adapter in a PC. This feature is called “logical multihoming” and is available in later versions of Windows. The maximum number of IP addresses that can be assigned to a single network adapter depends upon the Windows version:

Windows NT 3.51	Maximum of 6
Windows NT 4.0	Maximum of 25
Windows 2000	Maximum of 25
Windows XP	Maximum of 25

The procedure for assigning multiple IP addresses for a PC is described below.

## Which IP Addresses May be Assigned

You must follow certain guidelines in determining which IP addresses may be assigned to the WebSpray PC. Generally, such IP addresses need to meet the following three conditions:

- They must be valid IP addresses
- They must be allocated to your organization, and
- They must not be assigned to or in use on other computers or devices

Assigning IP addresses that do not meet the above criteria may cause invalid or unpredictable results, as WebSpray may be unable to receive responses on them. Furthermore, using IP address that are not accessible to the network on which the WebSpray PC is connected or that are already in use by other computers can cause other network equipment to not function properly.

Contact your Network Administrator if you are not sure which IP addresses may be safely assigned.

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**Warning** Assigning in-use IP addresses can cause equipment on your network to function improperly. WebSpray does not validate any IP addresses that are specified for its use.

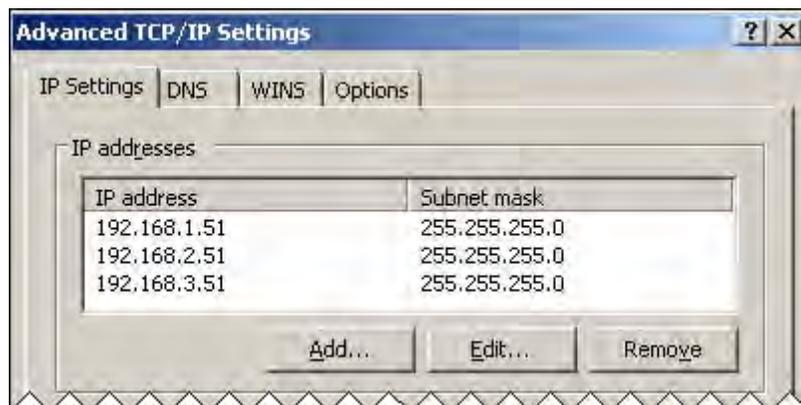
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## Limit of IP addresses that may be assigned

The maximum number of IP addresses that may be assigned to the WebSpray PC is governed by Windows

## Setting Multiple IP Addresses

The procedure for setting multiple IP addresses varies by Windows version. See the sections below for the installed Windows version on the WebSpray PC.



### Windows 2000

- 1 Start -> Settings -> Network and Dial-up Connections ->
- 2 Select 'Internet Protocol (TCP/IP)' and hit the Properties button
- 3 Hit Properties button
- 4 Select 'Internet Protocol (TCP/IP)' and hit the Properties button
- 5 Enable the 'Use the following IP address' radio button
- 6 Specify the first IP address, Subnet mask, and Default gateway to be configured for the PC
- 7 Hit the Advanced... button
- 8 On the IP Settings tab, hit the Add button
- 9 Specify the IP address and Subnet mask for the next IP address to be configured for the PC
- 10 Repeat steps 8 and 9 until all IP addresses have been configured
- 11 Hit the OK button on the current and next two screens to complete the configuration.

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**Note** The PC may require rebooting upon completing the procedure for the new settings to take affect

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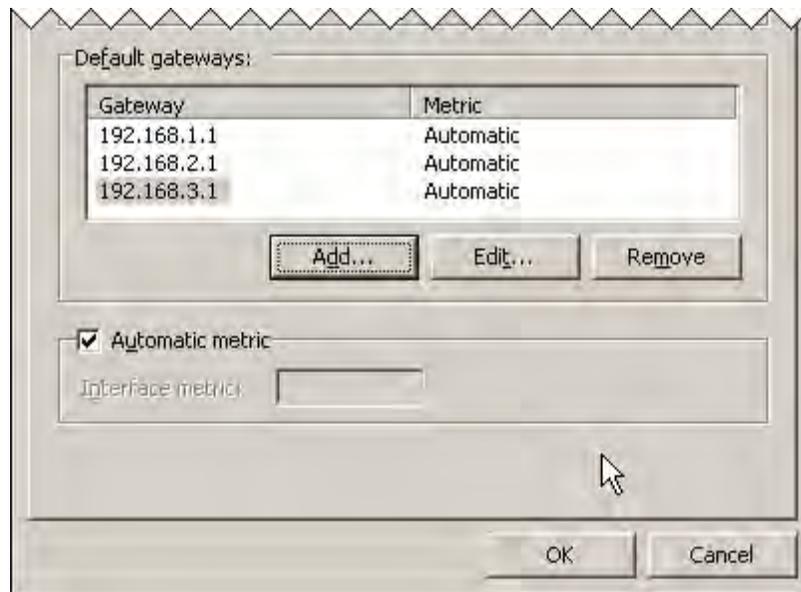
### Other windows versions

To assign multiple IP addresses under other Windows versions, refer to the documentation for the Windows version you are using.

## Configuring WebSpray PC for Physical Multihoming

Unlike logical multihoming, in which multiple IP addresses are assigned to a single network adapter, “physical multihoming” uses multiple network adapters.

The configuration process for physical multihoming is similar to that for logical multihoming, except because each network adapter needs to be on its own network having its own gateway,



## Testing Using Multiple WebSpray PCs

To achieve maximum client test volume, you can use multiple PCs each running WebSpray. These PCs can be setup and configured for either physical or logical multihoming, or a combination thereof.

When running WebSpray on multiple PCs, there is no coordination between them; so it is necessary to specify the same options on all the WebSpray PCs, start tests at the same time, and consolidate the results.

## Appendix E

# Troubleshooting

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## Common problems and resolutions

The following table contains some common problems, their probable causes, and resolutions. If you do not see the problem you are experiencing and are unable to resolve it, contact CAI Networks, Inc. Technical Support per Appendix F.

Problem	Probable Cause	Resolution
Spray All button and menu option are disabled	A scan has not been performed	Perform a scan, then spray
Spray Selected button and menu option are disabled	Either 1) a scan has not been performed or 2) no URLs have been selected	1) Perform a scan, then spray or 2) select at least one URL
Client IP Addresses menu option is disabled	There is only one IP address assigned to the WebSpray PC	Assign additional IP addresses to the WebSpray PC
No pages are qualified by scan	The correct protocol for the head page was not specified	Specify the correct protocol for the head page
Expected pages are missing from scan report	They did not qualify based on the Web server and/or Target Scope specification	Correct the Web server and/or Target Scope specification and re-scan
...	...	...

## Execution Log File

Every time the GUI or CLI is run an execution log file is automatically generated in the installation directory (/Program Files/CAI Networks/WebSpray). The GUI generates a file with the following name structure: WebSpray-YYYYMMDD(#).log. The CLI generates: WebSpray Command Line-YYYYMMDD(#).log. Where YYYY is the year, MM is the month, DD is the day, and (#) is the number of sessions run.

The execution log file contains more detailed information on WebSpray's activities during the scan and spray modes. Should a test run not go as expected, the information in these log files may be helpful in pinpointing the problem.

The execution log files are not automatically deleted and can quickly accumulate after numerous test runs. It is recommended you periodically delete the unneeded log files to save hard drive space.

# Technical Support

## Introduction

CAI Networks, Inc. provides a variety of support options to help you get the most from WebSpray. This appendix describes these options.

## Internet Support

For up-to-date support information, visit our web site at [www.cainetworks.com](http://www.cainetworks.com) and go to the Support page. You can lodge a support request there by filling out the form. It will be sent to our Technical Support specialists and you will receive a response by email or telephone.

## Email Support

You can send your support request to our Technical Support department via email. The address is:

[support@cainetworks.com](mailto:support@cainetworks.com)

Be sure to include sufficient information about your configuration and question or problem so that we may provide a complete reply. If your issue is related to a particular public Web server, please include the URL of that server so that we may attempt to reproduce the problem.

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