



Welcome to **webApp.secure**TM

Find out how easy it is to secure your
Web assets.

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Multiple Instances

Multiple instances of `webApp.secure™` can be used to protect multiple IP-based virtual websites on the same server. Each instance runs as a separate process with its own configuration.

If you host multiple websites on the same physical server using IP-based virtual hosting, then you will need to set up a separate instance for each IP. Set the `<listen-ip>` property (see **Server Setup** below) of each instance to the IP address of each website.

It is common to set up multiple directory trees (one per website) under the installed directory (typically `/usr/local/wa`) tree which would include:

- bin (can be a symbolic link to `../bin`)
- cert (if required)
- etc
- html (can be a symbolic link to `../html`)
- iug
- logs

By default, `bin/wa` uses `/usr/local/wa` as the “root”, but can be overridden using the `-path` command-line directive (i.e. “`bin/wa -path /usr/local/wa/site2`” - see `wa` man pages for details).

Location. Location. Location.

Key file names and paths are specified in the configuration file `etc/wa.conf`.

properties_file

The `webApp.secure`[™] runtime properties are stored in a well-formed XML document at this location. Neither the location, nor the file name, holds any significance to `webApp.secure`.

log_file

System activity can be logged to a line-delimited text file at this location. Neither the location, nor the file name, holds any significance to `webApp.secure`.

alert_log_file

Malicious activity is logged to this well-formed XML document. Neither the location, nor the file name, holds any significance to `webApp.secure`. (Purging or renaming the active alert log through an automated batch process is generally acceptable.)

log_level

The level of detail logged to the activity log file is controlled by this setting. “no”, “min”, “user”, and “admin” are the four available levels ranging from none to very detailed, respectively.

truncate_log

When set to “true”, the activity log file will be truncated at startup. When set to “false”, the activity log file will be appended to at startup.

Server Setup

The following properties specify the TCP/IP communication settings of the Web server and `webApp.secure`.

Web Server Name <web-server-name />

Identifies the internal reference of the Web server `webApp.secure` is protecting (i.e. “192.168.0.2”).

This is typically an IP address or internal server name.

Web Server Port <web-server-port />

Identifies the TCP port number of the Web server `webApp.secure` is protecting (i.e. “8080”).

If `webApp.secure` is running on the physical Web server, this should be a non-standard port number. However, if they are running on separate machines, this can be any valid TCP port number not accessible from the outside.

Listen IP <listen-ip />

An optional IP address that `webApp.secure` should use (i.e. “192.168.0.2”).

If no IP is specified, `webApp.secure` will use all available.

Listen Port <listen-port />

The TCP port number `webApp.secure` will use for unencrypted traffic (i.e. “80”).

Normally this will be the standard HTTP port 80.

Internet Host Name(s) <host-names><host-name /></host-names>

One or more fully-qualified external host names of the website(s) `webApp.secure` is protecting (i.e. “www.mydomain.com”).

Add an entry for each name-based virtual website hosted on the Web server.

User-defined Policies (HTML content)

The **Entry Points** properties identify one or more URI's that are accessible without restriction from the outside - i.e. a “starting point” for the website/application. web/insite™ begins automatically identifying the **Intended Use Guidelines**™ from this (these) point(s).

Entry Point(s) <entry-points><entry-point /></entry-points>

Represents one or more public URI's that are initial entry points into the website and/or application. The root URI (/) is set up by default and it is common to also specify the root document name (i.e. /index.html) specifically.

Use wildcard characters “*” (one or more alpha-numeric characters), “?” (single alpha-numeric character), and “#” (single numeric character) to specify entry points that may have a variable component (i.e. /default.asp?var=* would allow “/default.asp?var=1”, but not “/default.asp?x=1”).

An optional **protocol="https"** attribute can be used for any <entry-point /> that should be accessed through an encrypted connection only.

User-defined Policies (non-HTML content)

The **Unprotected Directories** properties identify one or more URI's that are accessible without restriction from the outside. These should be paths to images or other non-HTML content.

Unprotected Dir(s) <unprotected-dirs><unprotected-dir /></unprotected-dirs>

A URI path that is accessible without restriction. Generally, these are used to specifically open access to non-HTML directories (i.e. /images/*.gif).

They can be useful to specify access to resources that webApp.secure is not able to automatically recognize as part of the **Intended Use Guidelines**.

When the <process-javascript /> property (see **Advanced properties** section) is enabled, it should not be necessary to define any <unprotected-dir />'s.

An optional **protocol="https"** attribute can be used for any <unprotected-dir /> that should be accessed through an encrypted connection only.

Real-time Attack Notification

Choose from 2 available real-time alert mechanisms that best suites your environment. Email, HTTP, and/or network notifications let you know what's going on.

SMTP

Enable <smtp-alert><enable /></smtp-alert>

Set to “True” enable real-time email notification of malicious activity.

Server Name <smtp-alert><server /></smtp-alert>

The email server name or IP address (i.e. “mail.mydomain.com”).

Server Port <smtp-alert><port /></smtp-alert>

The email server TCP port number (i.e. “25”).

Subject <smtp-alert><subject /></smtp-alert>

Text to appear in the subject line to help identify the origin of the alert email (i.e. “Alert from Web server 1”).

From <smtp-alert><from /></smtp-alert>

A “from” email address. (i.e. “server1@mydomain.com”).

Recipient(s) <smtp-alert><recipients><recipient /></recipients></smtp-alert>

One or many recipient email addresses (i.e. “admin@mydomain.com”).

HTTP

Enable <http-alert><enable /></http-alert>

Set to “True” to enable a real-time HTTP POST request of malicious activity.

Server Name <http-alert><server /></http-alert>

The HTTP server name or IP address (i.e. “192.168.0.100”).

Server Port <http-alert><port /></http-alert>

The HTTP server TCP port number (i.e. “80”).

Action <http-alert><action /></http-alert>

The URI of the receiving script (i.e. “/cgi-bin/alert.cgi”).

From <http-alert><from /></http-alert>

An optional name to help the receiving CGI script (see <action /> above) identify the origin of the alert message.

Audit Trails

Use the **Logging** properties to establish audit trails.

Syslog <syslog />

Set to “True” to enable logging alerts and error messages to syslog.

Activity Flush Count <activity-flush-count />

A numeric value that represents the number of lines to cache before flushing the activity log (see `activity_log_file` in `etc/wa.conf`). A higher value can improve performance, but could result in the loss of data in the event of a catastrophic system failure.

Log Request Header(s)

<log-request-headers><log-request-header /></log-request-headers>

Zero or more request HTTP headers you would like written to the activity log file (see `activity_log_file` and `log_level` in `etc/wa.conf`) regardless of `log_level` (i.e. “User-agent:”).

Log Response Header(s)

<log-response-headers><log-response-header /></log-response-headers>

Zero or more response HTTP headers you would like written to the activity log file (see `activity_log_file` and `log_level` in `etc/wa.conf`) regardless of `log_level` (i.e. “Content-length:”).

W3C Extended Logging

Enable <w3c-extended-log-file><enable /></w3c-extended-log-file>

Set to “True” to enable logging transactions in standard W3C extended log file format.

Truncate <w3c-extended-log-file><truncate /></w3c-extended-log-file>

Set to “True” to truncate the active W3C extended log file at startup (rarely used).

Log File Directory

<w3c-extended-log-file><log-file-directory /></w3c-extended-log-file>

Directory path to write W3C extended log files (i.e. “/usr/local/wa/logs/w3c/”).
NOTE: If the path does not exist, it will NOT be created, but will result in an error.

Rollover Hourly

<w3c-extended-log-file><rollover-period><Hourly /></rollover-period></w3c-extended-log-file>

Set to “True” to start a new W3C extended log file every hour.

Rollover Daily

<w3c-extended-log-file><rollover-period><Daily /></rollover-period></w3c-extended-log-file>

Set to “True” to start a new W3C extended log file every day (24 hours).

Rollover Weekly

<w3c-extended-log-file><rollover-period><Weekly /></rollover-period></w3c-extended-log-file>

Set to “True” to start a new W3C extended log file every week (7 days).

Rollover Monthly

<w3c-extended-log-file><rollover-period><Monthly /></rollover-period></w3c-extended-log-file>

Set to “True” to start a new W3C extended log file every month (30 days).

Fields <w3c-extended-log-file><fields><field /></fields></w3c-extended-log-file>

One or many standard W3C fields to be logged. Supported <field /> values are:

- date
- time
- c-ip
- cs-method
- cs-uri
- cs-uri-stem
- cs-uri-query
- s-status
- sc-bytes

Advanced Settings

The **Advanced** property group allows you to tailor performance and other settings to your environment.

Max Connections <max-connections />

The maximum number of simultaneous client connections that will be served. Once the threshold is reached, the operating system's listen queue will be used.

Max Listen Queue <max-listen-queue / >

The maximum number of pending connections in the operating system's listen queue.

Keep Alive Timeout <keep-alive-timeout / >

The number of seconds to wait for subsequent requests before closing a connection.

Hide Server Identity <hide-server-identity />

Set to "True" to avoid reporting the Web server's identity to prevent banner-grabbing.

Passive Mode <passive-mode />

When set to "True", `webApp.secure`[™] will identify and report malicious activity, but will forward all requests on to the Web server.

Process JavaScript <process-javascript />

Set to "True" to interpret client-side JavaScript to extract **Intended Use Guidelines**[™].

Strict HTTPS <strict-https />

Set to "True" to strictly enforce access to https resources through an encrypted connection.

HTTP Method(s) <http-methods><http-method /></http-methods>

One or many HTTP request methods that will be allowed. POST, HEAD, and GET are recommended and are the default values.

Secure Sockets Layer

Use the SSL properties to enable encrypted traffic support. `webApp.secure`[™] must decrypt https traffic before forwarding valid transactions on to the Web server, but re-encrypting may not be necessary for every implementation (see `<encrypt-to-web-server />` below).

Enable `<ssl><enable /></ssl>`

Set to “True” to enable secure socket layer communication support.

Prompt Passphrase `<ssl><prompt-passphrase /></ssl>`

Set to “True” if the private certificate key is passphrase-protected.

Listen IP `<ssl><listen-ip /></ssl>`

Specific IP address `webApp.secure` should use for encrypted traffic (i.e. “209.123.123.123”).

If left blank, all available IP addresses will be used.

Listen Port `<ssl><listen-port /></ssl>`

The TCP port `webApp.secure` should listen on for encrypted traffic (i.e. “443”).

Normally the standard https port 443 will be used.

Encrypt to Web Server `<ssl><encrypt-to-web-server /></ssl>`

Set to “True” to enable re-encryption of validated traffic forwarded on to the Web server. If enabled, the `<web-server-port />` property must also be populated with an appropriate value (see below).

Web Server Port `<ssl><web-server-port /></ssl>`

The TCP port number of the Web server for encrypted traffic. This should be empty unless the `<encrypt-to-web-server />` property is set to “True” (see above).

Certificate, Key, CA Files `<ssl><cert-file /><cert-key-file /><ca-cert-file /></ssl>`

Full names and paths to the server certificate files.

`<ssl><allow-SSLv2 /></ssl>`

Set to “True” to allow SSLv2 client connections.

Application-manipulation Protection (PE only)

Application manipulation attack protection settings can be tailored to your environment.

Form Validation

Enable `<form-validation><enable /></form-validation>`

Set to “True” to enable HTML form field validation.

Release on Submit `<form-validation><release-on-submit /></form-validation>`

Set to “True” to release a form’s **Intended Use Guidelines™** from memory following successful validation. When set to “True”, memory utilization is more efficient, but may not fully support the use of the browser’s “back” button.

Cookie Validation

Enable `<cookie-validation><enable /></cookie-validation>`

Set to “True” to enable HTTP cookie validation.

Strict `<cookie-validation><strict-values /></cookie-validation>`

Set to “True” if requests that contain an altered cookie should be blocked and not forwarded on to the Web server. If this option is not enabled, requests that contain altered cookie values will be forwarded on to the Web server, but the cookie will be completely stripped.

Form Cleanup

Enable `<form-cleanup><enable /></form-cleanup>`

Set to “True” to enable cleanup of HTML form **Intended Use Guidelines** older than `<days />`, `<hours />`, `<minutes />`, and `<seconds />` (see below).

Days, Hours, Minutes, Seconds

`<form-cleanup><days /><hours /><minutes /><seconds /></form-cleanup>`

Establishes the timeframe for cleanup of HTML form **Intended Use Guidelines** older than `<days />`, `<hours />`, `<minutes />`, and `<seconds />`.

Cookie Cleanup

Enable `<cookie-cleanup><enable /></cookie-cleanup>`

Set to “True” to enable cleanup of HTTP cookie **Intended Use Guidelines™** older than `<days />`, `<hours />`, `<minutes />`, and `<seconds />` (see below).

Days, Hours, Minutes, Seconds

`<cookie-cleanup><days /><hours /><minutes /><seconds /></cookie-cleanup>`

Establishes the timeframe for cleanup of HTTP cookie **Intended Use Guidelines** older than `<days />`, `<hours />`, `<minutes />`, and `<seconds />`.

Special Character Filters

TEXT

```
<special-character-filters><char-set field-type="TEXT" /></special-character-filters>
```

Characters that should be stripped from TEXT type form fields to prevent SQL injection and cross-site scripting.

TEXTAREA

```
<special-character-filters><char-set field-type="TEXTAREA" /></special-character-filters>
```

Characters that should be stripped from TEXTAREA type form fields to prevent SQL injection and cross-site scripting.

PASSWORD

```
<special-character-filters><char-set field-type="PASSWORD" /></special-character-filters>
```

Characters that should be stripped from PASSWORD type form fields to prevent SQL injection and cross-site scripting.

Tighter Integration

The **API** (application programming interface) property group provides a mechanism useful for integrating **webApp.secure™** into your environment. See the **Application Programming Interface** section for details of the API features.

Enable `<api><enable /></api>`

Set to “True” to enable the API.

Listen IP `<api><listen-ip /></api>`

Specific IP address **webApp.secure** should use for the API (i.e. “127.0.0.1”).

If left blank, all available IP addresses will be used.

Listen Port `<api><listen-port /></api>`

The TCP port number **webApp.secure** should use for the API.

Browser-based Administration

The **Remote Administration** property group allows you to specify parameters for browser-based administration. There are safeguards to limit accessibility to the remote administration feature, and it does use SSL (https://), but it was designed to be used over an intranet.

Enable <remote-admin><enable /></remote-admin>

Set to “True” to enable browser-based administration.

Listen IP <remote-admin><listen-ip /></remote-admin>

Specific IP address webApp.secure™ should use for browser-based administration (i.e. “192.168.0.2”).

If left blank, all available IP addresses will be used.

Listen Port <remote-admin><listen-port /></remote-admin>

The TCP port number webApp.secure should use for browser-based administration (i.e. “8020”).

Password <remote-admin><password /></remote-admin>

The one-way hashed password to use for browser-based administration access.

NOTE: The default password is “admin” and can only be changed from the browser when this option is enabled.

Client IP(s) <remote-admin><client-ips><client-ip /></client-ips></remote-admin>

One or more client IP addresses that are allowed to connect to webApp.secure for browser-based administration (i.e. “192.168.0.105”).

If no IP’s are specified, connections will be accepted from any IP address.

Example Addressing from a Browser:

https://192.168.0.2:8020/

(Please note the use of https in the above example.)

Attack Insight

All malicious activity is logged to a well-formed XML file (see `alert_log_file` in `etc/wa.conf`).

The format of the alert message (in the alert log file, and/or delivered via email or HTTP) is:

<alert><date-time /></alert>

The date and time of the request (i.e. "Tue Feb 24 03:03:46 2008").

<alert><alert-msg /></alert>

webApp.secure™-generated message regarding the alert.

<alert><ip /></alert>

The IP address of the client that made the request (i.e. "192.168.0.2").

<alert><request /></alert>

The HTTP request line (i.e. "GET /scripts/nsiislog.dll HTTP/1.0").

<alert><action /></alert>

The action taken by webApp.secure (i.e. "Denied").

<alert><request-URI /></alert>

The URI component of the HTTP request line (i.e. "/scripts/nsiislog.dll").

<alert><method /></alert>

The HTTP request method (i.e. "GET").

<alert><status-code /></alert>

The HTTP status code returned to the client (i.e. "403").

NOTE: A status code of 200 generally means the request was not blocked, but special characters were filtered, which would be indicated in `<alert-msg />` (see above).

<alert><reason /></alert>

The webApp.secure attack category (i.e. "Forceful Browsing").

<alert><content-type /></alert>

The request content type.

<alert><host /></alert>

The value from the request "Host:" HTTP header.

You can analyze the alert log using any tool that supports XML.

Application Programming Interface (API)

An application programming interface (API) is available using the popular XML-RPC protocol.

Basic XML-RPC Call Layout

```
<?xml version="1.0"?>
<methodCall>
  <methodName />
  <params>
    <param>
      <value />
    </param>
  </params>
</methodCall>
```

Object/method Descriptions

Object	Method	Response
iug	addURI(String URI)	String URI
	removeURI(String URI)	
properties	get(String name)	Value value
	put(String name, Value value)	
statistics	dump()	Struct
	reset()	

Example Request

```
POST / HTTP/1.0
Content-type: text/xml
Content-length: [bytes]
```

```
<?xml version="1.0"?>
<methodCall>
  <methodName>iug.addURI</methodName>
  <params>
    <param>
      <value>
        <string>/link.jsp?param1=value1&param2=value2</string>
      </value>
    </param>
  </params>
</methodCall>
```

Example Response

```
HTTP/1.0 200 OK
Content-type: text/xml
Content-length: [bytes]
```

```
<?xml version="1.0"?>
<methodResponse>
  <params>
    <param>
      <value>
        <string>/link.jsp?p1=v1&p2=v2&[unique id]</string>
      </value>
    </param>
  </params>
</methodResponse>
```

Example Error Condition Response

```
HTTP/1.0 200 OK
Content-type: text/xml
Content-length: [bytes]
```

```
<?xml version="1.0"?>
<methodResponse>
  <fault>
    <value>
      <struct>
        <member>
          <name>faultCode</name>
          <value><int>[error-code]</int></value>
        </member>
        <member>
          <name>faultString</name>
          <value><string>[error-message]</string></value>
        </member>
      </struct>
    </value>
  </fault>
</methodResponse>
```

Helpful Links

<http://www.xmlrpc.com/>

<http://www.faqs.org/docs/Linux-HOWTO/XML-RPC-HOWTO.html>

<http://ws.apache.org/xmlrpc/>

Evaluation Installation Examples

The following are examples illustrating possible installation scenarios for evaluating webApp.secure™.

Example 1:

Web server and webApp.secure running on separate machines.

Web Server

Internal IP address:	192.168.0.10
External IP address:	209.98.241.200
Internal host identification:	WEB-SERVER-1
External host identification:	www.mydomain.com
HTTP TCP Port:	80

Workstation

Internal IP address:	192.168.0.25
Internal host identification:	WORKSTATION-1

In this example, webApp.secure is installed on the Workstation computer (WORKSTATION-1) which is part of the same internal network as the Web Server (WEB-SERVER-1).

webApp.secure

```
<web-server-name>192.168.0.10</web-server-name>
-OR-
<web-server-name>WEB-SERVER-1</web-server-name>
<web-server-port>80</web-server-port>
<listen-port>80</listen-port>
<host-names>
  <host-name>www.mydomain.com</host-name>
</host-names>
<site-test>False</site-test>
```

For the most realistic test, add the following line to the “hosts” file on the Workstation:

```
127.0.0.1 www.mydomain.com
```

Now all references to the host www.mydomain.com from browser sessions on the Workstation* will be directed through webApp.secure. Valid HTTP requests will then be forwarded on to the Web Server and corresponding HTTP responses will be returned to the browser.

NOTE:

It is important to clear the browser’s cache before testing to minimize the potential for false positives.

To perform essentially the same test without modifying the hosts file on Workstation, simply make the following adjustment to the webApp.secure configuration:

```
<site-test>True</site-test>
```

This will direct all browser requests for http://localhost/, http://192.168.0.25/, and http://127.0.0.1/ through webApp.secure. Setting <site-test /> to True instructs webApp.secure to replace the browser’s HTTP “Host:” header with “www.mydomain.com” before forwarding valid requests on to the Web Server.

NOTE:

While setting `<site-test />` to True avoids having to modify the hosts file, fully-qualified URL's (links, images, etc.) inside HTML pages will bypass `webApp.secure™`, thereby decreasing the value and realism of the test.

* To direct Web traffic through `webApp.secure` from other workstations in the network, add the following line to their local hosts file:

```
192.168.0.25 www.mydomain.com
```

Example 2:

Web server and `webApp.secure` running on the same machine.

Web Server

Internal IP address:	192.168.0.10
External IP address:	209.98.241.200
Internal host identification:	WEB-SERVER-1
External host identification:	www.mydomain.com
HTTP TCP Port:	80

`webApp.secure`

```
<web-server-name>192.168.0.10</web-server-name>
-OR-
<web-server-name>WEB-SERVER-1</web-server-name>
<web-server-port>80</web-server-port>
<listen-port>1111</listen-port>
<host-names>
  <host-name>www.mydomain.com</host-name>
</host-names>
<site-test>False</site-test>
```

For the most realistic test, add the following line to the “hosts” file on any machine running a browser session:

```
192.168.0.10 www.mydomain.com
```

Now all references to the host `www.mydomain.com:1111` from browser sessions will be directed through `webApp.secure`. Valid HTTP requests will then be forwarded on to the Web Server and corresponding HTTP responses will be returned to the browser.

NOTE:

It is important to clear the browser’s cache before testing to minimize the potential for false positives.

To perform essentially the same test without modifying the hosts file on the Workstation(s), simply make the following adjustment to the `webApp.secure` configuration:

```
<site-test>True</site-test>
```

This will direct all browser requests for `http://localhost:1111/`, `http://192.168.0.25:1111/`, and `http://127.0.0.1:1111/` through `webApp.secure`. Setting `<site-test />` to “True” instructs `webApp.secure` to replace the HTTP Host: header with `www.mydomain.com` before forwarding valid requests on to the Web Server.

NOTE:

While setting `<site-test />` to True avoids having to modify the hosts file, fully-qualified URL's (links, images, etc.) inside HTML pages will bypass `webApp.secure`, thereby decreasing the value and realism of the test.

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