# TrafficShield™ Application Firewall

## Security Policy User Manual

Version 3.0

MAN-0128-00

# Service and Support Information

## Product Version

This manual applies to product version 3.0 of TrafficShield™ Application Firewall.

## Legal Notices

### Copyright

F5 Networks, Inc. (F5) believes the information it furnishes to be accurate and reliable. However, F5 assumes no responsibility for the use of this information, nor any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent, copyright, or other intellectual property right of F5 except as specifically described by applicable iControl user licenses. F5 reserves the right to change specifications at any time without notice.

### Trademarks

F5, F5 Networks, the F5 logo, BIG-IP, 3-DNS, iControl, GLOBAL-SITE, SEE-IT, EDGE-FX, FireGuard, Internet Control Architecture, IP Application Switch, iRules, OneConnect, Packet Velocity, SYN Check, Control Your World, ZoneRunner, uRoam, FirePass, and TrafficShield are registered trademarks or trademarks of F5 Networks, Inc. in the U.S. and certain other countries. All other trademarks mentioned in this document are the property of their respective owners. F5 Networks' trademarks may not be used in connection with any product or service except as permitted in writing by F5.

### Export Regulation Notice

This product may include cryptographic software. Under the Export Administration Act, the United States government may consider it a criminal offense to export this product from the United States.

### Export Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

### FCC Compliance

This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules, which are designed to provide reasonable protection against such radio frequency interference.

Operation of this equipment in a residential area may cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Any modifications to this device, unless expressly approved by the manufacturer, can void the user's authority to operate this equipment under part 15 of the FCC rules.

## Canadian Regulatory Compliance

This class A digital apparatus complies with Canadian I CES-003.

Cet appareil numérique de la classe A est conforme à la norme, NMB-003.

## Standards Compliance

The product conforms to ANSI/UL 60950-1-2002 1st edition and Certified to CAN/CSA C22.2 No. 60950-1-3 first edition.

# Table of Contents

# Getting Started

The F5 Networks TrafficShield™ Application Firewall is designed to protect mission-critical Web infrastructures against application layer attacks, and to monitor the protected Web applications. Complementing the limited protection provided by firewalls, load balancers and other types of data and service protection devices. TrafficShield security application analyzes traffic at network and application levels to handle a variety of threats, such as:

- Manipulation of cookies or hidden fields.
- Insertions of SQL commands or HTTP structures into user input fields in order to expose confidential information or to deface content.
- Malicious exploitations of the application memory buffer to stop services, to get shell access and to propagate worms.
- Unauthorized changes to server content via HTTP Delete and Put commands.
- Attempts aimed at causing the Web application to be unavailable or to respond slowly to legitimate users.
- Forceful browsing.

## Document Objectives

This manual explains how to set up a TrafficShield security policy and how to apply it to a Web application. The manual presents TrafficShield security application's security concepts, and shows how the concepts are implemented in the security policy context.

# How This Manual Is Organized

This manual consists of the following chapters:

*Chapter 1 The Security Policy:* This chapter explains how a TrafficShield security policy works, describes its components, and presents the tools that will help you collect the components automatically: the Policy Browser, the Crawler and the Learning module.

*Chapter 2 TrafficShield Workflow:* This chapter is your guide to this manual: it describes the steps to follow in creating, adjusting and maintaining a security policy. Subsequent chapters explain each step in detail.

*Chapter 3 Accessing TSMS:* This chapter explains how to access the TrafficShield Management Station (TSMS).

*Chapter 4 Policy Management Configuration:* This chapter describes how to create and Maintain Policies and all the policies different components different components.

*Chapter 5 Crawler:* This chapter guides you through the steps needed to create an initial policy using the Crawler module. This chapter also provides instructions on how to use the more advanced Crawler parameters.

*Chapter 6 Learning - Testing and Fine-Tuning the Policy:* This chapter explains how to use the Learning module to adapt the policy to real-life traffic requirements. It also covers the Policy editing feature, which allows you to view and manually adjust the entire security policy.

*Chapter 7 Monitoring:* Monitoring tools allow the network and policy administrators to monitor request traffic. This chapter explains how to use the TrafficShield security application monitoring tools to follow up on potential attacks and workload.

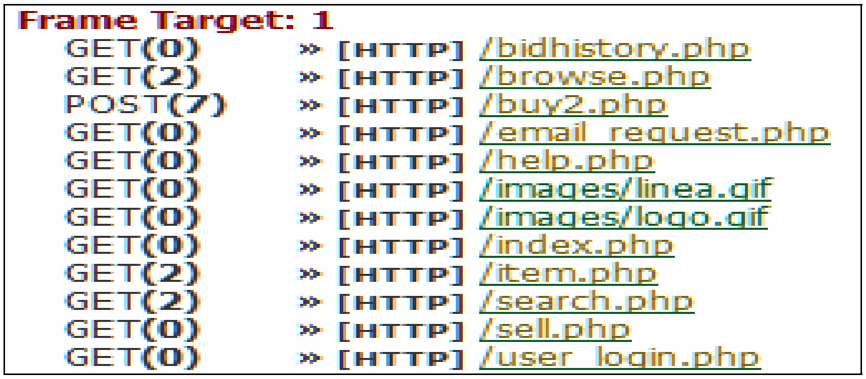
*Appendix A Glossary:* This appendix lists and defines relevant terms.

## Audience and Assumed Knowledge

This manual is intended for the Web application security administrator or application owner. It assumes acquaintance with the nature of Web application attacks and a working knowledge of the Internet and of HTTP requests.

## Conventions

Gold-colored lettered URLs point to referrer objects (please refer to Appendix A, Glossary for definition). Green URLs belong to non-referrer objects.



```
Frame Target: 1
   GET(0)      » [HTTP] /bidhistory.php
   GET(2)      » [HTTP] /browse.php
   POST(7)     » [HTTP] /buy2.php
   GET(0)      » [HTTP] /email_request.php
   GET(0)      » [HTTP] /help.php
   GET(0)      » [HTTP] /images/linea.gif
   GET(0)      » [HTTP] /images/logo.gif
   GET(0)      » [HTTP] /index.php
   GET(2)      » [HTTP] /item.php
   GET(2)      » [HTTP] /search.php
   GET(0)      » [HTTP] /sell.php
   GET(0)      » [HTTP] /user_login.php
```

## Related Documentation

The *Single-Unit Installation and Configuration Manual* explains how to configure the deployed TrafficShield unit and its backup.

# Chapter 1 The Security Policy

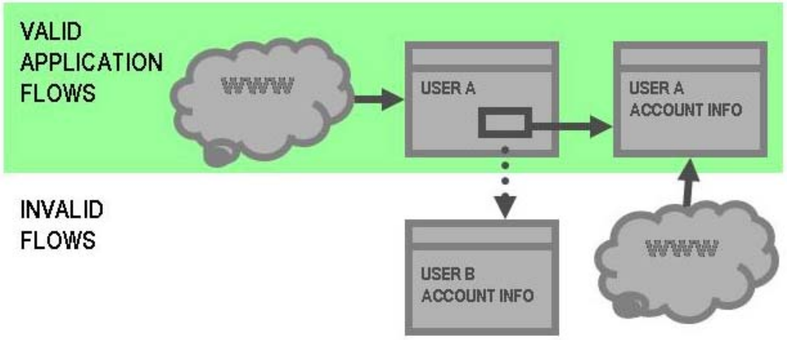
## Concept

The F5 TrafficShield Application Firewall uses positive security logic. This means that all traffic is illegal unless specifically known to be legal. The security policy is therefore a map of the application itself, containing all the application objects, flows and attributes that a user can make from any given point in the application.

The core of TrafficShield system's security functionality is the *security policy.* This policy determines which requests are valid and which are invalid. Depending on the work mode established, an invalid request can be blocked and reported, or only reported.

## How the Policy Works

We call this map the "Application Flow Model." Think of it as a model of the entire application: every object, every parameter, and every value range for each parameter is part of the flow.  By checking incoming traffic against the Application Flow Model, TrafficShield security application can screen out requests that do not follow the user behavior the application expects.



From every object in an application, a user may request access to a limited number of destinations. For example, when users log in to an online banking application, they are provided with several links to their respective accounts: savings, checking, and so on. They can click on each link to be directed to their personal account information and view it securely. This is the legitimate flow of the application, and this is the series of requests which are captured in the Application Flow Model.

Requests that are out of sequence or whose parameter values have been altered can be blocked once this security policy is in place. For instance, a user requesting an account information page, without first passing through login sequence, can be rejected, as this is not the correct order of the flow. Likewise, a user who logs in and then tampers with the account links provided on a page (attempting to access other people's accounts) would be rejected since the parameter values have changed.

**Note**

In each of these cases, the *format* and *structure* of the request is valid. It is only *within the specific context of the application* that these requests can be considered malicious.

# The Security Policy Components

The main components of the security policy are described in this section.

### Object Types

The Object Types section lists the existing file types in the protected Web site. For example, a list of valid object types for a specific policy could be: gif, jpg and html only. If your policy contains the above list, then any request for a PDF file would be considered illegal.

### Web Objects

The Objects (files) section lists the existing objects in the protected Web site. For example, a list of valid objects could be: myPict.gif, myPict.jpg and myFile.html only. If your policy contains the above list, then any request for yourFile.html would be considered illegal.

### Application Flows

The Application Flow (path) is the defined access path leading from one object to another object. For example, a list of valid flows would be:

from abc.html to abc.gif, OK

from abc.html to def.html, OK

If your policy contains the above list, then any request that tries to access abc.gif from def.html would be considered illegal.

**Tip:**

Back flows are created automatically.

### Flow Parameters

The parameters used by the request. For example:

A list of valid parameters can be:
https://192.168.51.51:1043/dms/policy/pl_flows.php?m_id=0_4

In the above example we have a single parameter: m_id.

If your policy contains the above list, then any request that tries to read a variable with a different name from m_id would be considered illegal.

Please refer to the next section for more details.

### Parameter Value Properties

The TrafficShield security application provides an option to define allowed value format for each parameter of the request. For example, a list of valid parameters can be: https://192.168.51.51:1043/dms/policy/pl_flows.php?m_id=0_4

In the above example we have a single parameter: m_id and TrafficShield is configured to only this valid value (0_4).

If your policy contains the above list, then calling this request with a value other than 0_4 would be considered illegal.

### Character Sets

A character set defines the allowed characters for the following request parts: Object, Parameter Name, HTTP header and User Input parameters per language.

If your policy contains a specific allowed character set that excludes the letter "Z" in the HTTP header part, then any request containing the letter "Z" in its header will be considered illegal.

### Negative Regular Expressions

Negative regular expressions describe possible attacks.

For example: a regular expression that defines forbidden directories:
(?i)(/cfdocs/|/RCS/|/CVS/|/test/|/siteserver/|/Msword/|/_errors/|/_scripts/|/_tests/|/_themes/)

If your policy contains the above negative regular expression, then any request for a URL matching this list of directories will be considered illegal.

### The Policy Build Tools

The policy is an intelligent map of your Web application. It contains not only a list of the files included in the Web application but also other data such as the types of the files, the length of some crucial strings, allowed value ranges for parameters and the relationships (links) between the files and the parameters passed from one file to another in a specific link.

You do not build this complex map yourself, which would be a tedious undertaking, especially if the Web application is updated frequently. TrafficShield security application provides the following tools for building this map:

- The **Policy Browser** collects important information about the site that the Crawler later uses while scanning the application. The user simply browses the application with it. The browser saves to a file the browsing information it encounters.

- The **Crawler** scans your application and builds a list of existing object types, objects, flows, parameters, and values, including objects generated by JavaScript code. It can also use as input the file created by the Policy Browser.
- The **Learning mechanism** analyzes real-life traffic and allows you to fine-tune the preliminary policy built by the Crawler.
- The **Policy Audit Tools** feature allows you to see the entire policy built for the Web application. It is a visual representation of the application itself, which can be easily edited using common sense and application knowledge. Although a policy could, in theory, be built using just the Crawler and Learning, editing the policy is an effective way to ensure its accuracy.

The Crawler, Learning mechanism, and Policy Editing capabilities complement each other. The Crawler issues a preliminary map. Subsequently, the Learning tool shows you whether the Crawler's decisions are consistent with the requirements of real-life traffic, and allows you to further tune your policy until it is ready. For more details, please refer to Chapter 5: Crawler in this document.

### What Happens to Illegal Requests

When the TrafficShield security application diagnoses a request as illegal, it processes it according to what you have asked it to do: it warns you but lets the request through, or warns you and blocks the request.

**NOTE:**

Another possibility is that the TrafficShield security application will redirect to a customized blocking response.

By defining Ignored Items, you can set TrafficShield security application to also discard recurring illegal requests without posting a warning.

# The Flow Properties

### Target Object

In simplistic terms, this is the “to” side for a flow that runs “from” and “to” an object.

### Referrer Object

This is the object from which the flow began its path to the Target Object.

### Method

This is the action done on the Target Object. For example: GET, POST, PUT and Delete.

### Target Frame

The Target Object will be loaded to this frame number.

**Note**

The TrafficShield security application frames.

### Has QS/PD

This flag indicates whether the HTTP/HTTPS request (for the requested object) has a query-string or a POST-data.

### Check QS/PD

This flag indicates whether the TrafficShield security application should verify if the request QS/PD complies with the policy. If the flag is TRUE, it enforces the defined policy of the request’s QS/PD; and if the is FALSE, it does not check the QS/PD.

### Number of Parameters

Maximal number of parameters in the HTTP/HTTPS request.

### Parameter List

This lists the parameters that can appear in the HTTP/HTTPS request.

# Chapter 2 TrafficShield Workflow

This chapter is your guide to the TrafficShield security application workflow: it describes the steps to follow in creating, adjusting, and maintaining a security policy.

The following table provides a summary of the steps to follow, and the resources needed to implement them.

| Stage | Resource Required | Time Required |
|---|---|---|
| Preliminary Stage:<br>Installing and Configuring the TrafficShield unit | Network engineer | 1-2 hours depending on the network infrastructure. |
| Stage 1:<br>Defining the Web application | Network engineer | 0.5-1 hour for small to medium Web applications and 3-4 hours for bigger and more complex Web applications. |
| Stage 2:<br>Creating and modifying the initial policy. | Policy Builder:<br>A person who has knowledge of the Web application. | 2 hours to set up. Crawler may take several minutes to several hours to run the automatic process. (Allow 1 hour for all static pages, and several minutes for each dynamic script.) |
| Stage 3:<br>Testing and fine-tuning the policy | Policy builder | 1 hour a day for 1-2 weeks |
| Stage 4:<br>Putting the policy into effect: Blocking | Policy builder | 1-2 hours |

## Preliminary Stage

This stage is done only once, the first time the TrafficShield security application unit is taken out of the box. This stage includes both the installation and the configuration of the unit.

The steps of the preliminary stage are described in the *Installation and Configuration Manual*.

## Stage 1 Defining the Web Application

This stage includes:

1. Creating the Web application definition and defining the TrafficShield hardware units included in the Web application.

This step is described in the *Installation and Configuration Manual.* The remaining stages are described in this manual.

## Stage 2 Creating a Policy

This stage includes:

1. Defining a new policy
2. Running the Crawler

The Crawler automatically creates a preliminary security policy for the application. Typically, the Crawler maps most of the objects, flows, and parameter value ranges in a Web application, including those generated dynamically using JavaScript and other client-side scripting means. This initial policy is never fully accurate, however. For instance, while the Crawler can determine parameter values for static parameters such as drop-down lists, it cannot always provide reasonable value ranges for user-input parameters. You can enter these finishing touches to the policy using the automated Learning mechanism and the Policy Management Configuration tools (stage 3).

## Stage 3 Testing and Fine-Tuning the Policy

After creating the initial policy using the Crawler, you can expose the application to user traffic in a non-blocking, “what if” mode. This can be safe traffic, that is, traffic generated by users who are not potential attackers. This is typically a small group of QA persons or the employees of your company. If the application is already active (i.e., a legacy application), you can apply the same procedure (again, in a non-blocking mode) and adjust the policy in order to maximize security and minimize the chance of false positives.

During the testing stage, TrafficShield security application captures the "illegal" requests and displays the appropriate information, such as URI lengths that exceed your expectations or attempts to access non-existing objects. Although you know what the values should be, and you may have entered them during your review, the real-life traffic may return unforeseen but legal user behavior and may lead you to further fine-tune the reviewed policy. This might involve adding missing objects to the policy, and adding parameters as well as parameter values. Through the real-life traffic, TrafficShield security application learns the real nature of legitimate requests and allows you to adapt the policy accordingly.

As real-life traffic is propagated through TrafficShield security application in none-blocking mode, the administrator can verify that:

- No false positive alarms have been posted.
- TrafficShield security application warns you in case real attacks are detected.

## Stage 4 Putting the Policy into Effect: Blocking

You know that your policy is ready when all the alerts generated in the Learning tables represent invalid requests, such as one-off requests for invalid information or automated scripting attacks. The absence of false warnings ("false positives", that is, warnings on requests that are actually legal) means that your policy contains all the necessary objects and flows, and that all of the parameters are set to values that are characteristic of non-harmful, real-life traffic.

The next step is to activate TrafficShield security application’s Blocking Mode. This can be done gradually, as the policy is more mature and tested. Through a set of simple checkboxes, you tell TrafficShield security application what to block. For example, by activating the "Illegal File Type" blocking, TrafficShield security application will consider illegal any request referring to a file whose type is not included in the policy.

Any warnings that the Learning module might return after you activate all of the desired blockings should be considered as potentially harmful behavior warnings. For more information about warnings generated after a first revision of the policy, please refer to Chapter 4 Policy Management Configuration.

# Chapter 3 Accessing TSMS

This chapter explains how to access the TrafficShield Management Station (TSMS). The TrafficShield Management Station (TSMS) is a Web-based tool built in to the TrafficShield Application Firewall. You use the TSMS to run Configuration Administration operations.

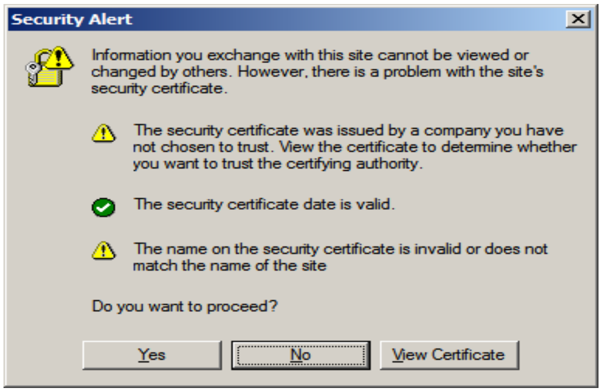
## Accessing TSMS

*To access TSMS:*

1. On a PC from which the TrafficShield unit can be reached, use your Web browser to connect to the TrafficShield management portal. Point the browser to the TS Private or Permanent IP specified during the initial configuration script. Use custom SSL port 1043:

   https://ip.add.re.ss:1043

   A security alert message may appear.



Security Alert

Information you exchange with this site cannot be viewed or changed by others. However, there is a problem with the site's security certificate.

⚠ The security certificate was issued by a company you have not chosen to trust. View the certificate to determine whether you want to trust the certifying authority.

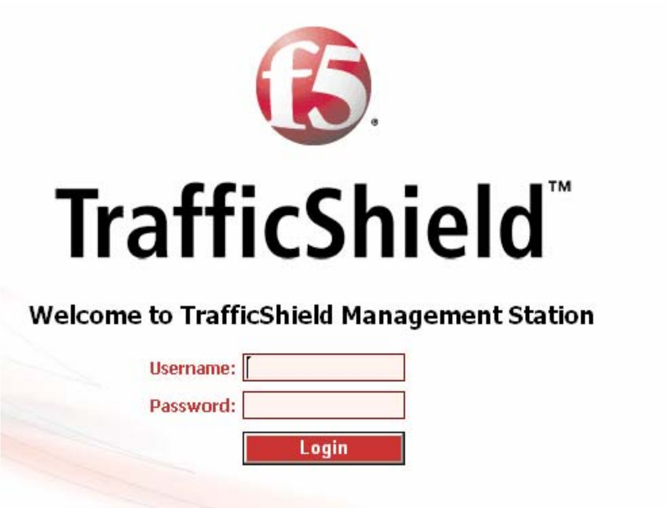
✓ The security certificate date is valid.

⚠ The name on the security certificate is invalid or does not match the name of the site

Do you want to proceed?

2. Click yes to continue.

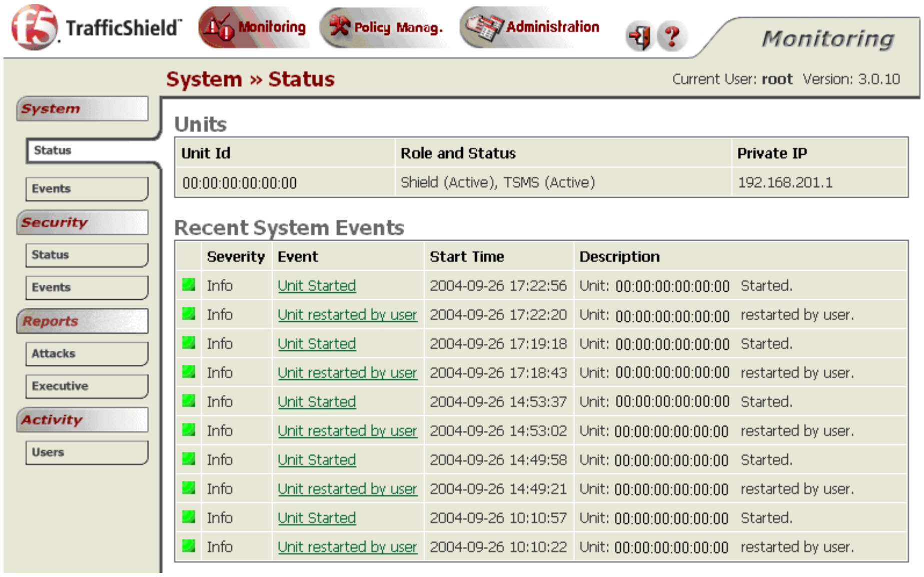
   The logon page opens.



Welcome to TrafficShield Management Station

3. Enter the TrafficShield security application Web Administrator's user name and password that you defined earlier, and click the Login button.

   The TrafficShield system opens. It defaults to the Monitoring page.



System » Status

Current User: **root** Version: 3.0.10

Units

| Unit Id | Role and Status | Private IP |
|---|---|---|
| 00:00:00:00:00:00 | Shield (Active), TSMS (Active) | 192.168.201.1 |

Recent System Events

| | Severity | Event | Start Time | Description |
|---|---|---|---|---|
| 🟩 | Info | Unit Started | 2004-09-26 17:22:56 | Unit: 00:00:00:00:00:00 Started. |
| 🟩 | Info | Unit restarted by user | 2004-09-26 17:22:20 | Unit: 00:00:00:00:00:00 restarted by user. |
| 🟩 | Info | Unit Started | 2004-09-26 17:19:18 | Unit: 00:00:00:00:00:00 Started. |
| 🟩 | Info | Unit restarted by user | 2004-09-26 17:18:43 | Unit: 00:00:00:00:00:00 restarted by user. |
| 🟩 | Info | Unit Started | 2004-09-26 14:53:37 | Unit: 00:00:00:00:00:00 Started. |
| 🟩 | Info | Unit restarted by user | 2004-09-26 14:53:02 | Unit: 00:00:00:00:00:00 restarted by user. |
| 🟩 | Info | Unit Started | 2004-09-26 14:49:58 | Unit: 00:00:00:00:00:00 Started. |
| 🟩 | Info | Unit restarted by user | 2004-09-26 14:49:21 | Unit: 00:00:00:00:00:00 restarted by user. |
| 🟩 | Info | Unit Started | 2004-09-26 10:10:57 | Unit: 00:00:00:00:00:00 Started. |
| 🟩 | Info | Unit restarted by user | 2004-09-26 10:10:22 | Unit: 00:00:00:00:00:00 restarted by user. |

# Chapter 4 Policy Management Configuration

This chapter explains the procedure for creating a new policy. Note however, that the configuration process, explained in the installation manual, always creates a default policy. This means that by now you already have at least one policy defined in the TrafficShield Management Station (TSMS), either empty or populated. You can manually modify the default policy or re-run the Crawler in order to further update the policy.

**Tip**

This also creates a default policy for the Web application.

**Tip**

After any changes are made to the Policy, it is important to click the Set Active Policy button to re-activate the policy with the changes.

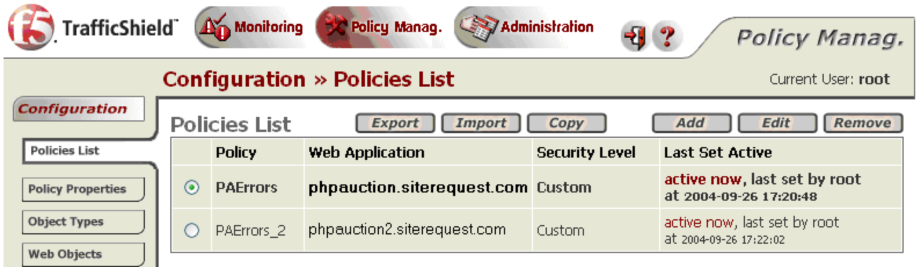
**Note**

A policy record can be created only if at least one Web Application entry was created. For more details on how to define Web applications in the TrafficShield security application, please refer to Chapter 4 – Web Applications, in the Installation and Configuration Manual.

## Add a new policy

1. Navigate to the Policy Management tab-> Policies List tab.

   A list of existing policies appears. If you ran the TrafficShield configuration wizard, the first time you access this page you will see the policy you defined or selected via the wizard.



Configuration » Policies List

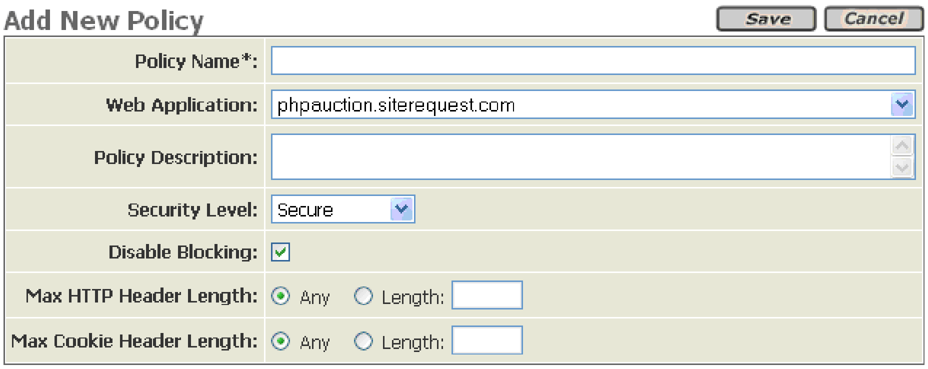
Current User: root

Policies List

|  | Policy | Web Application | Security Level | Last Set Active |
|---|---|---|---|---|
| ● | PAErrors | phpauction.siterequest.com | Custom | active now, last set by root at 2004-09-26 17:20:48 |
| ○ | PAErrors_2 | phpauction2.siterequest.com | Custom | active now, last set by root at 2004-09-26 17:22:02 |

2. Click the Add button.

   The Add New Policy page opens.



Add New Policy

| | |
|---|---|
| Policy Name*: | |
| Web Application: | phpauction.siterequest.com |
| Policy Description: | |
| Security Level: | Secure |
| Disable Blocking: | ☑ |
| Max HTTP Header Length: | ● Any ○ Length: |
| Max Cookie Header Length: | ● Any ○ Length: |

3. Enter the information described below and click the Save button to save your information. This will automatically open the Policy Properties tab.

   **Policy Name**
   Enter a name for this policy. You can use any name.

   **Web Application**
   Specify the address (www…) of the Web application to which this policy will be applied.

   You can define different policies for the same Web application but only one policy can be active for a certain Web application at any given time.

   **Policy Description**
   Optionally, enter a few words that describe this policy.

**Security Level**

The default security level is secure. Each level contains a different set of violation driven action.

**Tip**

You must save the policy before you can view the Custom security level and edit the violation driven actions. For more information, please refer to the Blocking Policy Table section in this chapter.

**Disable Blocking**

See the Blocking Policy Table section in this chapter.

**Max HTTP Header Length**

The maximum length a request processed by this policy is allowed. 0 means unlimited length. Initially this field will be populated by the Crawler. The value can be changed manually by the user or automatically by the Learning process.

By choosing the Any button, any HTTP header length will be allowed.

**Max Cookie Header Length**

The maximum length a cookie processed by this policy is allowed.

By choosing the Any button, any Cookie header length will be allowed.

# Policy Properties

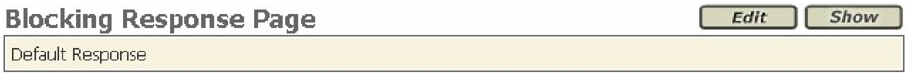
When you save a new policy record, the policy properties appear. You can access the properties of a policy also by clicking the Policy Properties tab, in the left Navigation Panel.

## Editing the current policy’s properties

### Blocking Response Page

Responses returned by the Web server to requests can be verified against the negative regular expressions applied to

"Server response data" (See the File Type Associations section in this document). In cases where the response evaluates to the negative regular expression, a default response is returned, but you can replace it with a customized response.


Blocking Response Page

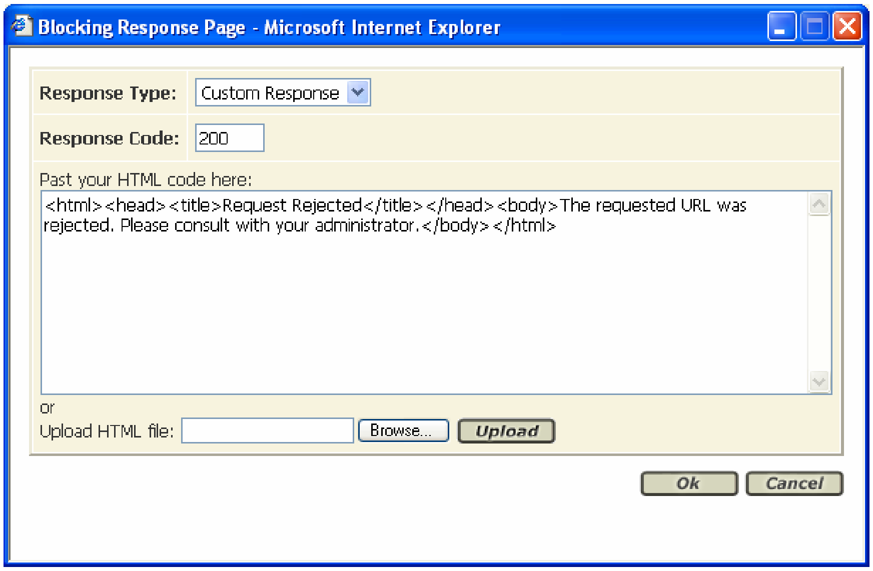
Default Response

The response is an HTML page. You can build the page here or use a page stored elsewhere.

Click the Show button to display the current blocking response page in a popup window.

*To edit a response page:*

1. In the Blocking Response Page section, click the Edit button.
   The Blocking Response Page opens.
2. Upon Completion, click the OK button to save your changes.


Blocking Response Page - Microsoft Internet Explorer

Response Type: Custom Response

Response Code: 200

Past your HTML code here:

```
<html><head><title>Request Rejected</title></head><body>The requested URL was
rejected. Please consult with your administrator.</body></html>
```

or

Upload HTML file:

**Response Type**
This field defines the type of response page that will be displayed to the user. If you select the default

response, you can see its HTML code but you cannot change it. The possible values that can be selected here are:

- **Default Response** – This is the default web page in the TrafficShield security application.
- **Redirect URL** – this means that instead of a web page, the TrafficShield security application returns to the user an HTTP redirect URL (which means that the browser will request and present to the user the URL that is defined by the user).
- **Custom Response** – This means that the user has defined that this is the page the TrafficShield security application will returned to the user.

**Response Code**

Do not change the Response Code.

**Paste your HTML code here**

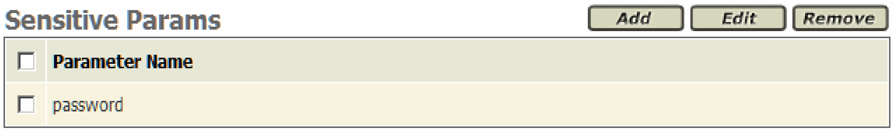
You can either paste In "Paste your HTML code here" type (or paste) the page's HTML code or in the next field upload a file.

**Upload HTML file**

Use the browser button to select the HTML file that will serve as the response page, and click the Upload button to load the file as the response page.

## Sensitive Parameters

All incoming requests, valid and invalid, are stored in TrafficShield security application in plain text format. Some requests may include user input, such as a password or a credit card number, that you may not want to store once the request has been processed (a string of asterisks will be stored instead of the actual value). You can avoid storing this sensitive data by entering the names of the input fields in the Sensitive Parameters sections.

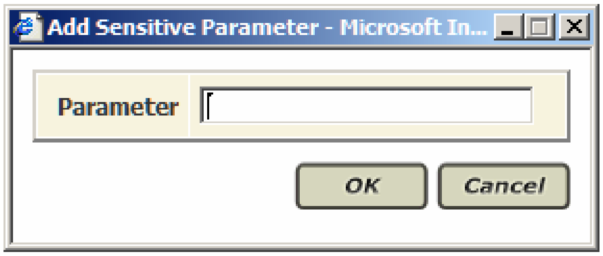


Sensitive Params

| □ | Parameter Name |
|---|---|
| □ | password |

*To specify a sensitive parameter:*

1. Click the Add button.
   The Add Sensitive Parameter box opens.



2. In Parameter, enter the name of a sensitive field.
   Enter the name of the input field exactly as defined in the request. For example:

   http://siterequest.com/bank.php?account=12345

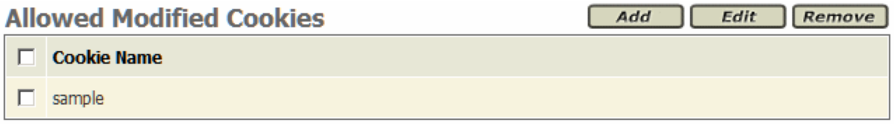
   If you define the field account to be a sensitive parameter, it will be displayed in the following manner:

   /bank.php?account=XXXXX

3. Click OK.

## Allowed Modified Cookies

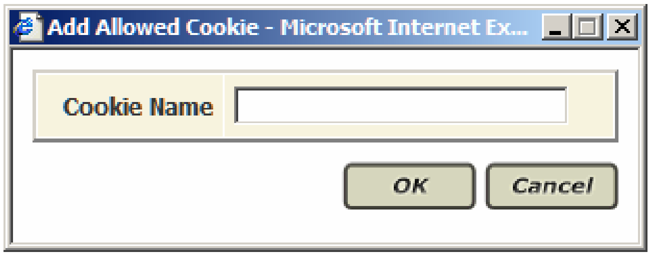
You can set the policy to ignore certain cookies included in the request even if they do not meet the expected criteria. This is done in the Allowed Modified Cookies section by simply listing their names.



| □ | Cookie Name |
|---|---|
| □ | sample |

*To define an allowed cookie:*

1. Click the Add button.
   The Add Allowed Cookie box opens.



2. In Cookie Name, enter the name of an allowed cookie.

   Enter the name of a cookie exactly as it is expected to appear in the request.

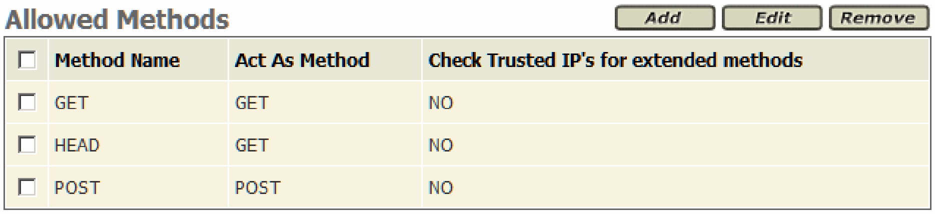
3. Click OK.

## Allowed Methods

TrafficShield security application accepts certain methods upon installation. The default methods are listed in this section when you first access it. See example below.

TrafficShield security application considers as invalid all requests that use HTTP methods other than those listed in the Allowed Methods section.

You can set other HTTP methods valid by adding them to the list.

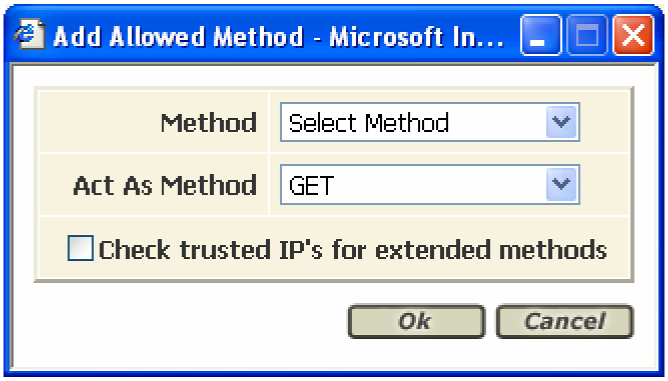


| □ | Method Name | Act As Method | Check Trusted IP's for extended methods |
|---|---|---|---|
| □ | GET | GET | NO |
| □ | HEAD | GET | NO |
| □ | POST | POST | NO |

*To allow an additional method:*

1. Click the Add button.
2. The Add Allowed Method window opens.
3. Enter the new method’s information and click OK to save and return to the Policy properties window.

Or to exit the window without saving the information, click Cancel.



Add Allowed Method - Microsoft In...

Method: Select Method

Act As Method: GET

□ Check trusted IP's for extended methods

**Method**

Select the name of an allowed method.

**Act as Method**

Select the mode of operation allowed for the additional method.

**Check trusted IPs for extended methods**

Check the "Check trusted IPs for extended methods" checkbox to allow this additional method only if it appears in requests sent by one of the trusted IPs.

Clearing this checkbox will make the method valid in all incoming requests. For details about trusted IP addresses, see Chapter 4 - Web Applications, in the Configuration Manual.

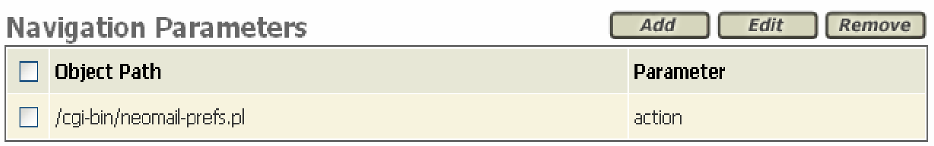
## Navigation Parameters

In some Web applications, pages can be dynamically built by server-side scripting. In such cases, pages are generated based on parameters passed to the Web server. To allow TrafficShield security application to identify those otherwise "invisible" pages and to build the appropriate flows, you need to specify the exact names of the parameters passed to the server. The parameter names are specified in the Navigation Parameters section.

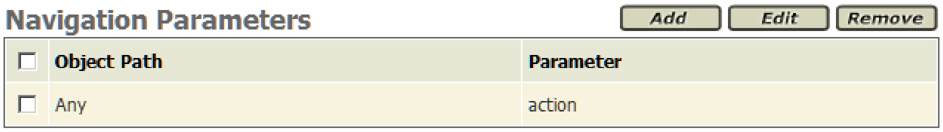
**Note**

The two examples below demonstrate how the user can define a specific object path plus parameter, or if the policy contains a common parameter used by more than one object path, how the user will need to define a general

Navigation path: *Any* and the common parameter name, as displayed below.



| □ | Object Path | Parameter |
|---|---|---|
| □ | /cgi-bin/neomail-prefs.pl | action |

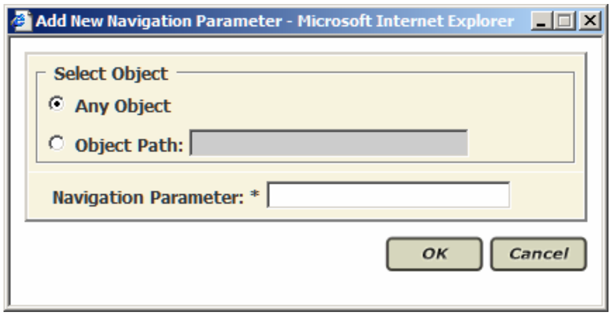


| □ | Object Path | Parameter |
|---|---|---|
| □ | Any | action |

*To specify a navigation parameter passed to the Web server for dynamic page building:*

1. Click the Add button.

   The Add New Navigation Parameter window opens. Enter the new navigation parameter's information and click OK to save.

   Select Object

   ● Any Object

   ○ Object Path:

   Navigation Parameter: *

2. In Select Object, select one of the following:

   **Any Object**
   If the Web application consists of just one physical page (the index page), select Any Object.

   **Object Path**
   If the Web application contains physical pages and dynamic page building starts from one of them, select Object Path and enter the URL of that object.

**Navigation Parameter**

In Navigation Parameter, enter the name of the parameter passed to the Web server for page building purposes.

# Blocking Policy Table

This section describes in detail the Blocking Policy table.

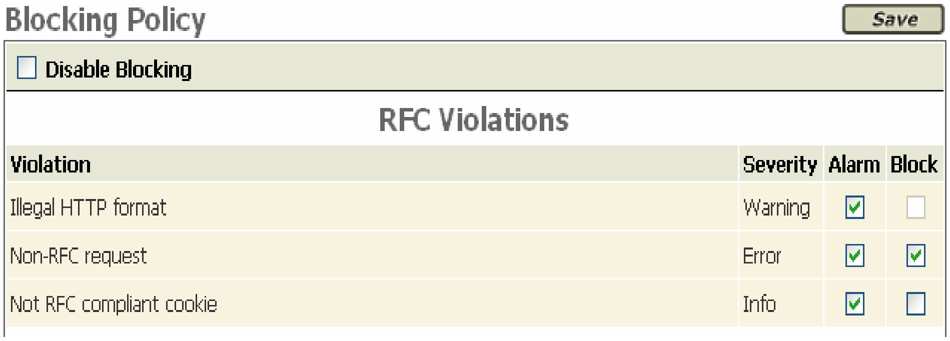
To navigate to this table, the user should choose the Policy management->Policy Properties tab.

This table is accessed when the user clicks the Edit button for the custom security level in the Policy Properties section.

**Tip**

If this is a new policy, then you must save the policy with the current default security level before you can change the level to custom and edit the violation driven actions.

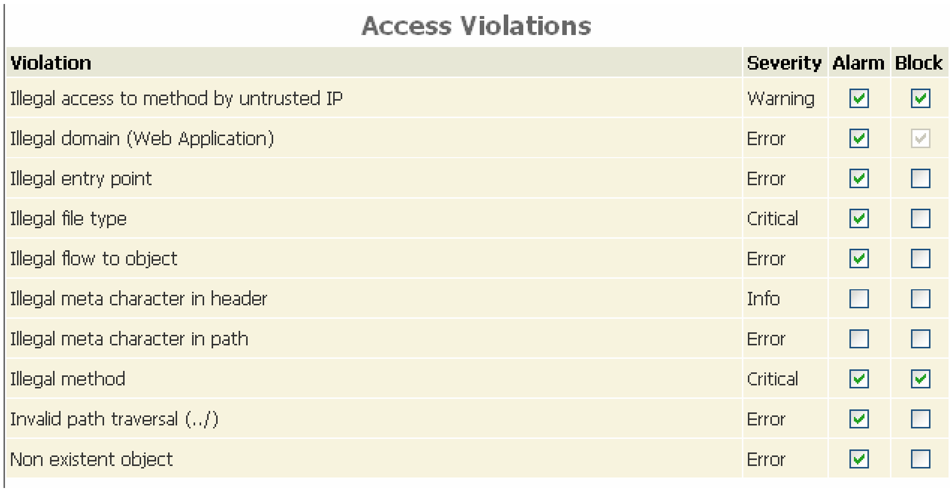
Each blocking category is described separately.



RFC Violations

| Violation | Severity | Alarm | Block |
|---|---|---|---|
| Illegal HTTP format | Warning | ☑ | □ |
| Non-RFC request | Error | ☑ | ☑ |
| Not RFC compliant cookie | Info | ☑ | □ |

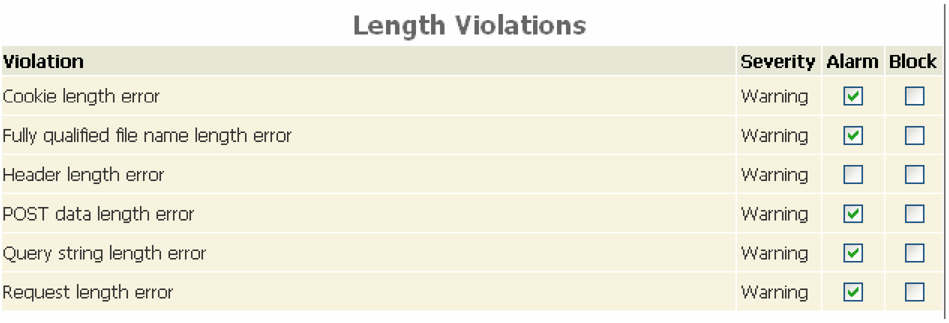
| **Access Violations** | |
|---|---|
| **Filter** | **Description** |
| Violation:<br>Illegal HTTP format | Request was received from a Client IP that is not allowed to use the method in the request. See "Methods" described in the Policy section and "Trusted IPs" described in the Web Application section of this manual.<br>The HTTP format received does not answer the following list of criteria:<br>Request line is illegal: either the method or resource or HTTP version is missing.<br>HTTP version is not HTTP/1.0 or HTTP/1.1<br>Host of the header is missing |
| Non RFC request | Binary Data in the user input contradicts user input type or method. |
| Not RFC compliant cookie | Cookie format does not follow RFC. |



Access Violations

| Violation | Severity | Alarm | Block |
|---|---|---|---|
| Illegal access to method by untrusted IP | Warning | ☑ | ☑ |
| Illegal domain (Web Application) | Error | ☑ | ☑ |
| Illegal entry point | Error | ☑ | □ |
| Illegal file type | Critical | ☑ | □ |
| Illegal flow to object | Error | ☑ | □ |
| Illegal meta character in header | Info | □ | □ |
| Illegal meta character in path | Error | □ | □ |
| Illegal method | Critical | ☑ | ☑ |
| Invalid path traversal (../) | Error | ☑ | □ |
| Non existent object | Error | ☑ | □ |

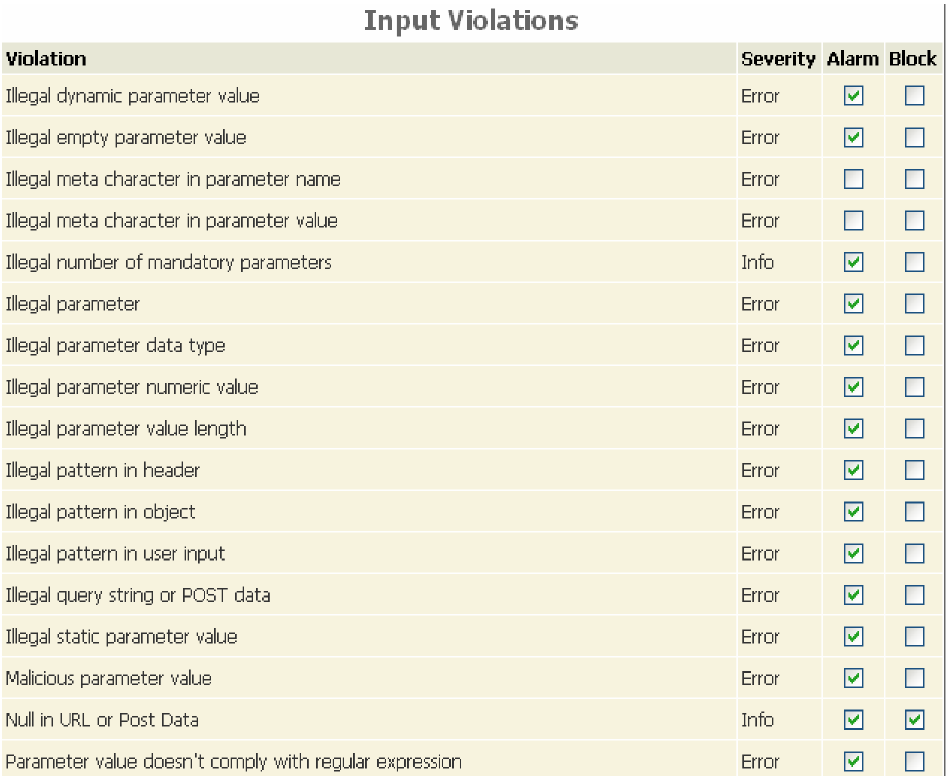
| **Access Violations** | |
|---|---|
| **Filter** | **Description** |
| Illegal access to method by un-trusted IP | Request was received from a Client IP that is not allowed to use the method in the request. See "Methods" described in the Policy section and "Trusted IPs" described in the Web Application section of this manual. |
| Illegal domain (Web Application) | Host header value doesn't match any of the Web application FQDNs defined in the TSMS. |
| Illegal entry point | The requested resource is not an acceptable entry page to the Web Application. |
| Illegal file type | Requested resource type (extension) is not defined in the policy. |
| Illegal flow to object | The transition from the previous resource to the requested one is illegal. |
| Illegal meta character in header | The HTTP header value contains a character that is set to "N" (false) in the Administration->CharSets->HTTP Headers field. |
| Illegal meta character in path | The Object part of the URI contains a character that is set to "N" (false) in the Administration->Character Sets->Object Path field. |
| Illegal method | The method is not defined in the policy properties as an allowed method. |
| Invalid path traversal | The request issuer attempted to access upper level directories in the directory tree. |
| Non existent object | Requested object is not listed in the policy. To better understand, please refer to the Reviewing the Object Types section in the Policy Components Editing chapter in this manual. |



Length Violations

| Violation | Severity | Alarm | Block |
|---|---|---|---|
| Cookie length error | Warning | ☑ | ☐ |
| Fully qualified file name length error | Warning | ☑ | ☐ |
| Header length error | Warning | ☐ | ☐ |
| POST data length error | Warning | ☑ | ☐ |
| Query string length error | Warning | ☑ | ☐ |
| Request length error | Warning | ☑ | ☐ |

| **Length Violations** | |
|---|---|
| **Filter** | **Description** |
| Cookie length error | Cookie header value length exceeds the threshold set in the policy. |
| Fully qualified file name length error | Resource name length exceeds the policy limit. |
| Header length error | Header name + value length exceeds the HTTP Header Length set in the Policy Properties. |
| POST-data length error | Request method is POST and the user input data length exceeds the policy limit. |
| Query-string length error | Request method is GET and the user input data length exceeds the policy limit. |
| Request length error | Request length exceeds the maximum reques length defined in the policy. |

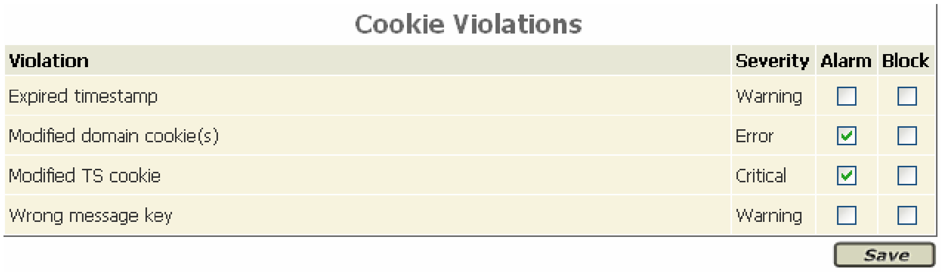


Input Violations

| Violation | Severity | Alarm | Block |
|---|---|---|---|
| Illegal dynamic parameter value | Error | ☑ | □ |
| Illegal empty parameter value | Error | ☑ | □ |
| Illegal meta character in parameter name | Error | □ | □ |
| Illegal meta character in parameter value | Error | □ | □ |
| Illegal number of mandatory parameters | Info | ☑ | □ |
| Illegal parameter | Error | ☑ | □ |
| Illegal parameter data type | Error | ☑ | □ |
| Illegal parameter numeric value | Error | ☑ | □ |
| Illegal parameter value length | Error | ☑ | □ |
| Illegal pattern in header | Error | ☑ | □ |
| Illegal pattern in object | Error | ☑ | □ |
| Illegal pattern in user input | Error | ☑ | □ |
| Illegal query string or POST data | Error | ☑ | □ |
| Illegal static parameter value | Error | ☑ | □ |
| Malicious parameter value | Error | ☑ | □ |
| Null in URL or Post Data | Info | ☑ | ☑ |
| Parameter value doesn't comply with regular expression | Error | ☑ | □ |

| **Input Violations** | |
|---|---|
| **Filter** | **Description** |
| Illegal dynamic parameter value | Parameter value doesn’t match the dynamically generated pool of legal values. |
| Illegal meta character in parameter name | The parameter name contains a character that is set to “N” (false) in the Administration->Character Sets->Param Name |
| Illegal meta character in parameter value | The parameter value contains a character that is set to “N” (false) in the Administration->Character Sets->User Input: *language* |
| Illegal number of mandatory parameters | The number of mandatory parameters in the flow is different from the number of mandatory parameters defined in the policy. |
| Illegal parameter | Parameter is not defined in the flow. |
| Illegal parameter data type | Parameter value differs from the type assigned to the parameter in the policy. |

| **Input Violations** | |
|---|---|
| **Filter** | **Description** |
| Illegal parameter numeric value | Numeric (decimal or integer) parameter value exceeds the value range set for it in the policy. |
| Illegal parameter value length | Parameter value length exceeds the length limitation set for it in the policy. |
| Illegal pattern in header | One of the HTTP header values evaluates to at least one negative regular expression applied to the "Header value". See the Negative RegExp section in the TrafficShield Unit Installation/Configuration manual. |
| Illegal pattern in object | Evaluates to a negative regular expression applied to the Object part of the URI. |
| Illegal pattern in user input | Evaluates to a negative regular expression applied to the "Key-value pairs". Test is done on user input for both POST and GET methods. |
| Illegal Query-String or POST-Data | Request contains user input not expected to be found in the flow. |
| Illegal static parameter value | Parameter value doesn't match any of the values in the Static pool of values for a given parameter. |
| Malicious parameter value | Parameter value matches one of the regular expressions describing common web attacks, i.e. XSS, SQL injection. |
| Null in URL or POST Data | NULL character in the parameter value of the user input. |
| Parameter value doesn't comply with regular expression | The Parameter value doesn't evaluate to the positive regular expression which defines the valid values for this parameter. |



Cookie Violations

| Violation | Severity | Alarm | Block |
|---|---|---|---|
| Expired timestamp | Warning | □ | □ |
| Modified domain cookie(s) | Error | ☑ | □ |
| Modified TS cookie | Critical | ☑ | □ |
| Wrong message key | Warning | □ | □ |

| **Cookie Violations** | |
|---|---|
| **Filter** | **Description** |
| Expired Timestamp | TrafficShield cookie timestamp is outdated. |
| Modified domain cookie(s) | One of the domain cookies was illegally modified by the Client side. |
| Modified TS cookie | TrafficShield cookie was illegally modified by the Client side. |
| Wrong Message Key | TrafficShield cookies contain different identifiers (random number). |

During the Learning stage, the alarms should diminish. At this point you can be confident that all missing objects have been added, and other attributes are attuned to real-life traffic requirements. The blocking mode should be activated only after monitoring traffic without any Learning alarms for several days.

The trigger for activating the Blocking mode is any point in time that the user can reasonably assume that the policy is accurate: meaning, all resources are present and all attribute values meet the requirements of legitimate real-life traffic and, therefore, any further alarm should be considered as suspicious.

After activating the blocking mechanism, illegal requests may continue to appear in the Learning pages: you can still accept their suggestions if they are justified, or you can alternatively clear them out.

## Blocking by categories

Blocking is implemented by telling the TrafficShield security application what to consider as illegal.

An illegal request is a request whose content contradicts the policy settings. Therefore, most filtering attributes correspond to policy attributes that you are familiar with. For example, by filtering "Illegal file types" you instruct the TrafficShield security application to consider a request as invalid if it tries to access an object of a type not included in the policy.

You do not have to activate all of the available blockings.

*To set blocking categories:*

1. Access the Policy Management and select the relevant policy from the Policies List tab.

2. Press the Policy Properties tab on the left side menu or the Edit button above the policy list to open the Policy Properties window. The properties displayed belong to the currently chosen policy.

3. In Security Level, select one of the standard levels, or select Custom.

   The Basic level provides minimal blocking and the High Security level provides comprehensive blocking. The Custom option allows you to access the blocking table itself and to activate or deactivate the blockings you want. If you select Custom, click the Edit button that appears next to the field in order to access the blockings table.

   The rest of this procedure relates to the Custom option.

   If you want to disable blocking temporarily, check the Disable Blocking checkbox in the Policy Properties tab, clearing the box reactivates the selected blockings.

4. Go over each blocking category and define what the TrafficShield security application should do when an illegal request matches the category’s definitions. The options are:

**Alarm**

Check the Alarm checkbox to instruct the TrafficShield security application to only post an alarm to the Learning pages without blocking the Web application user.

**Block**

Check the Block checkbox to instruct the TrafficShield security application to prevent the Web application user from accessing the specific Web object.

You can check both boxes. Some Block boxes are checked and grayed, meaning that requests that commit that specific violation are always blocked.

5. Click the Update button, and it is very important to click the Set Active Policy button.

### Using Learning in Blocking Mode

After you enable the blocking mechanism, the Learning system continues to analyze traffic. The requests that end up in the Learning tabs are those that contradict the policy. You can still accept some or all of them if they warrant policy changes, or clear them if they do not.

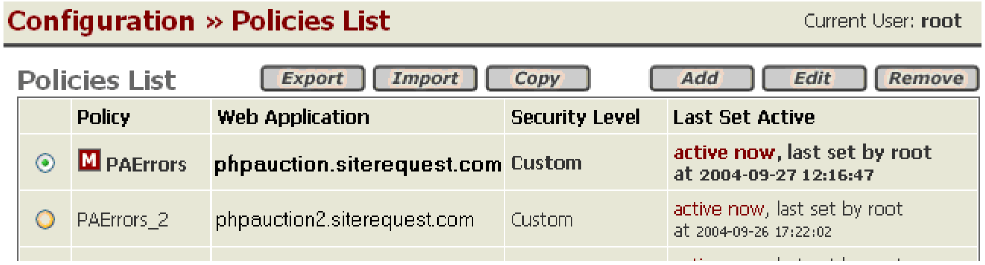
## Other policy activities

### Edit a policy

There are two ways to choose the existing policy you would like to edit:

*To choose a policy via the Policies List:*

1. Policy Management -> Policies List tab. Select the relevant policy to edit by checking the radio button at the left of the policy name.



Configuration » Policies List

Current User: root

Policies List

| | Policy | Web Application | Security Level | Last Set Active |
|---|---|---|---|---|
| ● | M PAErrors | phpauction.siterequest.com | Custom | active now, last set by root at 2004-09-27 12:16:47 |
| ○ | PAErrors_2 | phpauction2.siterequest.com | Custom | active now, last set by root at 2004-09-26 17:22:02 |

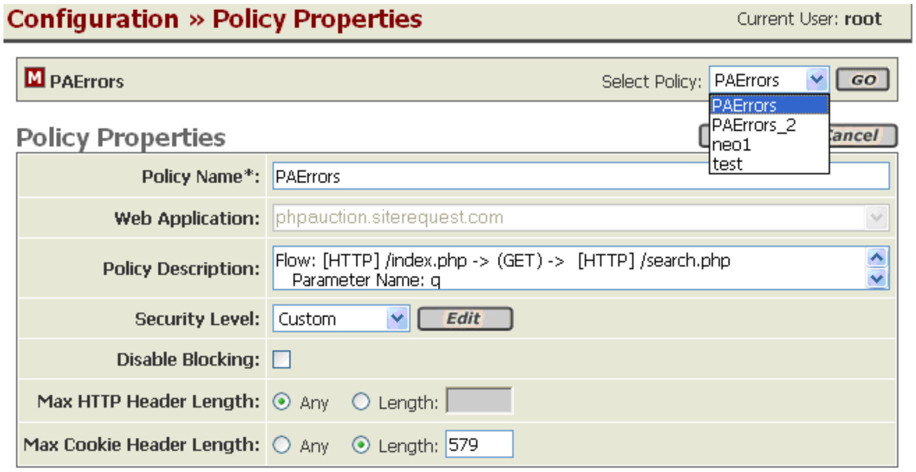
2. Click the Edit button.

3. The policy properties window is automatically displayed for viewing or modifying.

*To choose a policy via the Policy Properties window:*

1. Policy Management -> Policies Properties tab. Select the relevant policy from the pull-down list *Select Policy* and click the *Go* button.

2. The policy properties window is automatically updated to the selected policy for viewing or modifying.



Configuration » Policy Properties

Current User: root

M PAErrors

Select Policy: PAErrors

Policy Properties

| | |
|---|---|
| Policy Name*: | PAErrors |
| Web Application: | phpauction.siterequest.com |
| Policy Description: | Flow: [HTTP] /index.php -> (GET) -> [HTTP] /search.php<br>Parameter Name: q |
| Security Level: | Custom |
| Disable Blocking: | □ |
| Max HTTP Header Length: | ● Any ○ Length: |
| Max Cookie Header Length: | ○ Any ● Length: 579 |

## Remove a policy

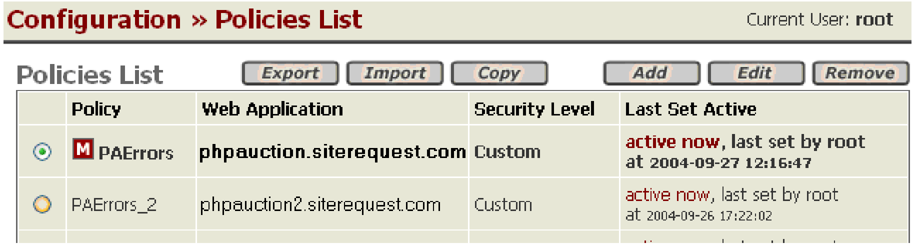
1. To remove a policy, choose the Policy Management -> Policies List tab. Select the relevant policy to remove by checking the radio button at the left of the policy name.

**Tip**

You cannot remove a policy if it is active.

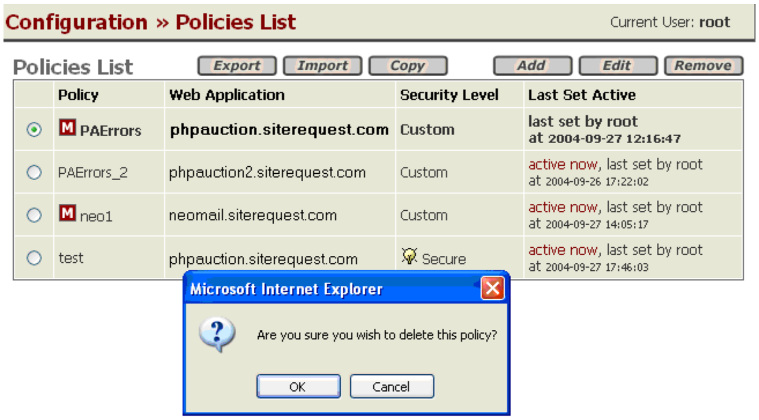
Since it is not possible to deactivate an already activated policy, you will need to return to the Administration->Web Application tab and activate another policy that also belongs to the same Web Application. Then you can return to the Policies List tab and remove the relevant policy.

If the policy you want to remove is the only policy related to this Web Application, you will need to remove the Web Application.



| | Policy | Web Application | Security Level | Last Set Active |
|---|---|---|---|---|
| ● | M PAErrors | phpauction.siterequest.com | Custom | active now, last set by root at 2004-09-27 12:16:47 |
| ○ | PAErrors_2 | phpauction2.siterequest.com | Custom | active now, last set by root at 2004-09-26 17:22:02 |

2. Click the Remove button.
3. Click OK to remove the policy.



| | Policy | Web Application | Security Level | Last Set Active |
|---|---|---|---|---|
| ● | M PAErrors | phpauction.siterequest.com | Custom | last set by root at 2004-09-27 12:16:47 |
| ○ | PAErrors_2 | phpauction2.siterequest.com | Custom | active now, last set by root at 2004-09-26 17:22:02 |
| ○ | M neo1 | neomail.siterequest.com | Custom | active now, last set by root at 2004-09-27 14:05:17 |
| ○ | test | phpauction.siterequest.com | Secure | active now, last set by root at 2004-09-27 17:46:03 |

Are you sure you wish to delete this policy?

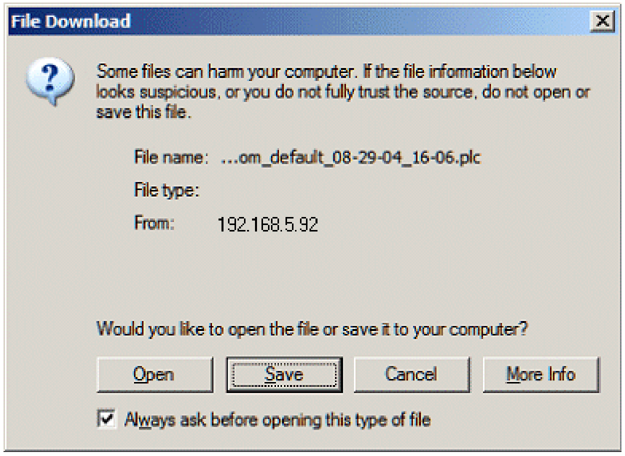
## Export/Import a policy

There are different reasons for using the Export/Import policy. The export/import feature can be used to export a policy and then import it, assigning it to a different Web application in the process.

This feature can also be used as a sort of backup and roll-back point in the policy life cycle.

*To export a policy:*

1. In the Policy Management module, select the Policies List tab and click the Export button. The Standard File Download dialog box opens.



File Download

Some files can harm your computer. If the file information below looks suspicious, or you do not fully trust the source, do not open or save this file.

File name: ...om_default_08-29-04_16-06.plc

File type:

From: 192.168.5.92

Would you like to open the file or save it to your computer?

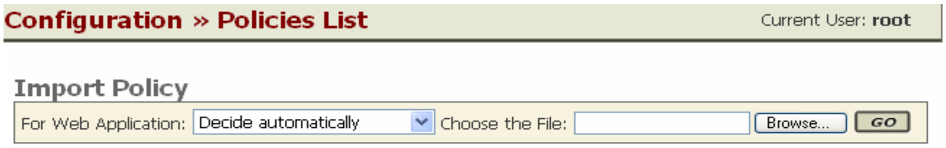
☑ Always ask before opening this type of file

2. Click the Save button and save the policy file.

*To import a policy:*

1. In the Policy Management module, select the Policies List tab and click the Import button.

   The Import Policy page opens.



Configuration » Policies List

Current User: root

Import Policy

For Web Application: Decide automatically

Choose the File:

2. Fill out the Import Policy page.

**For Web Application**

To populate this field, select one of the following:

- Select Decide Automatically to assign the imported policy to the Web application from which it was exported.
- Select another Web Application to assign the imported policy.

**Choose the File**

In Choose the File, use the browser to select the file to import.

3. Click the *Go* button.

**Note**

The imported policy appears in the Policies List. If the imported policy exists in the current TrafficShield security application environment, it is renamed (a sequential number is added to the end of the policy name).

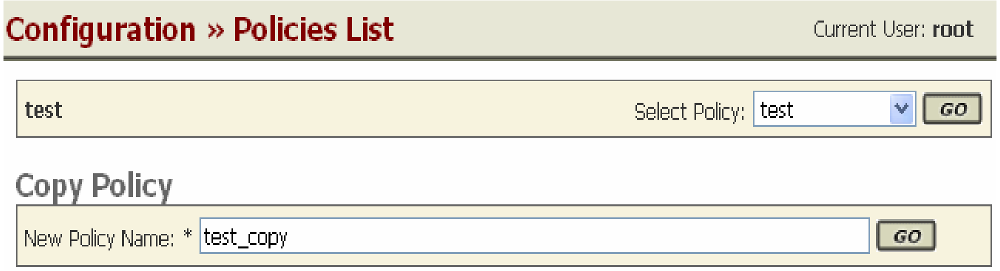
## Copy a policy

The purpose of this option is to quickly duplicate policies or create policies that differ only in a few details

*To copy a policy:*

1. In the Policy Management module, select the Policies List tab and click the Copy button.

   The Copy Policy page opens.



Configuration » Policies List

Current User: root

test

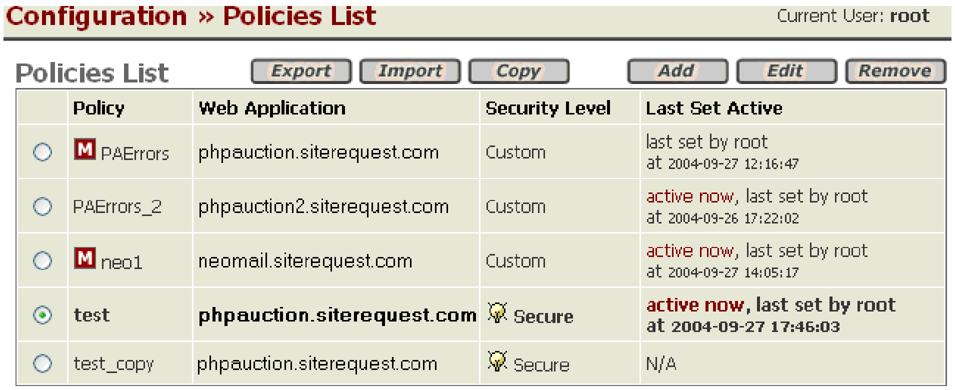
Select Policy: test

Copy Policy

New Policy Name: * test_copy

2. Verify that the relevant Policy has been selected. Change the selected policy in the Select Policy pull-down list and click the Go button to changed the selected policy.

3. The New Policy Name field in the Copy Policy window will be automatically updated accordingly.
4. You can edit the New Policy Name if required.
5. Click the *Go* button to copy the policy.
6. In the Policies List tab verify that the newly copied policy is added to the list.



Configuration » Policies List

Current User: **root**

Policies List

| | Policy | Web Application | Security Level | Last Set Active |
|---|---|---|---|---|
| ○ | M PAErrors | phpauction.siterequest.com | Custom | last set by root<br>at 2004-09-27 12:16:47 |
| ○ | PAErrors_2 | phpauction2.siterequest.com | Custom | active now, last set by root<br>at 2004-09-26 17:22:02 |
| ○ | M neo1 | neomail.siterequest.com | Custom | active now, last set by root<br>at 2004-09-27 14:05:17 |
| ● | **test** | **phpauction.siterequest.com** | **Secure** | **active now, last set by root**<br>**at 2004-09-27 17:46:03** |
| ○ | test_copy | phpauction.siterequest.com | Secure | N/A |

# Chapter 5 Crawler

This chapter explains how to configure, start, and manage the TrafficShield security application Crawler tool.  It also guides you through the steps needed to create an initial policy using the Crawler module. You use the Crawler to scan your application and build a preliminary map of your Web application. This chapter also provides instructions on how to use the more advanced Crawler parameters.

## Populating the Policy Using the Crawler

The TrafficShield security application Crawler automatically populates the security policy with the components of the Web application such as the HTML files, the picture files, the form fields, the links, and the flows that lead from one object to the other.

When you run the Crawler for the first time on a policy, it populates the policy with the current objects (application elements). The next time you run the Crawler:

a. It collects only the objects that were added after the last run.

b. It can be instructed to place the newly-added objects in a series of tables instead of adding them to the policy. This allows you to examine the new objects and decide what to do with them – add them to the policy or reject them. For additional details, please refer to the Data Collection with Policy Browser section in this document.

## Configuring and launching the Crawler

The Crawler can be configured in many ways.

First time users should activate the Crawler Wizard. The Crawler Wizard icon is located under Policy Management->Policy Properties->Build Tools. The Wizard will guide the user through a configuration stage, and enable the user to start the Crawler.

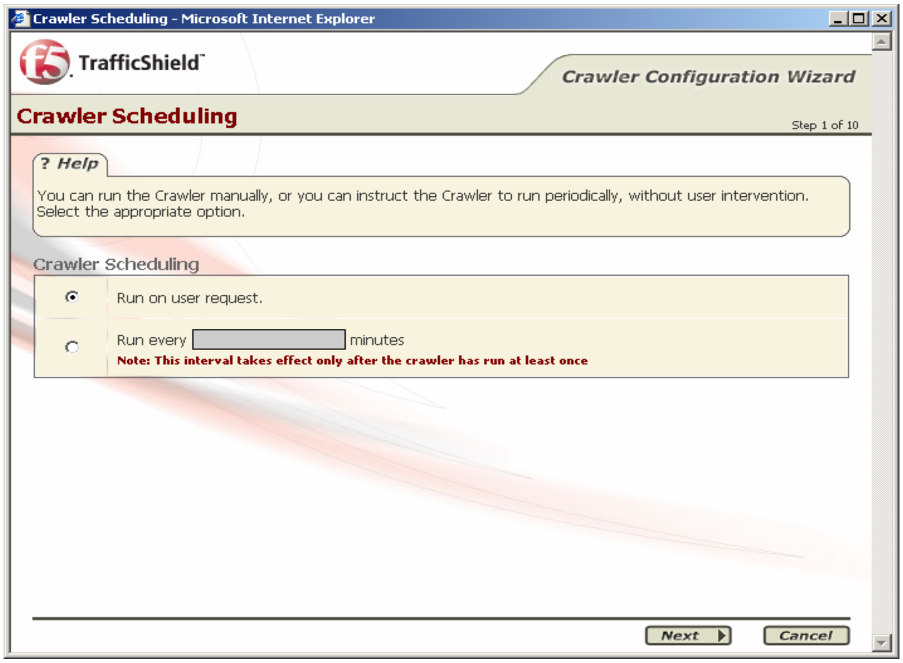
Advanced users may prefer to manually edit the Crawler settings and manually start the Crawler.

If your Web application has several entry points, you can instruct the Crawler to scan the application from each entry point separately. This is the advised method if your Web application site is combined from two or more unconnected parts.

*To configure and/or start the Crawler:*

1. Select the relevant policy for which the Crawler settings will apply, Policy Management->Policies List.
2. Open the policy for editing by selecting the policy you want to work on and clicking on the Policy Properties tab or the EDIT button.
3. Go to the Build Tools section and, per your desired work mode, begin to work with the Crawler.

## Configuring and Starting the Crawler via the Crawler Wizard


Crawler Scheduling - Microsoft Internet Explorer
TrafficShield
Crawler Configuration Wizard
Next
Cancel

Crawler Scheduling

Step 1 of 10

? Help

You can run the Crawler manually, or you can instruct the Crawler to run periodically, without user intervention. Select the appropriate option.

Crawler Scheduling

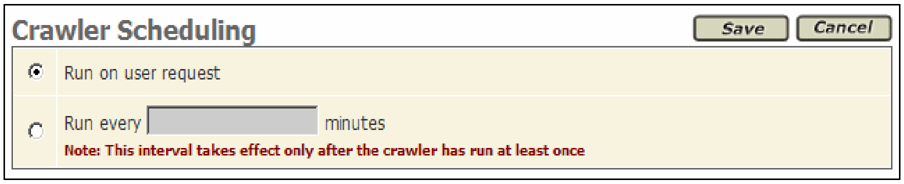
● Run on user request.

○ Run every minutes

Note: This interval takes effect only after the crawler has run at least once

### *Crawler Scheduling*

You can run the Crawler manually, or you can set the Crawler to run periodically. This is defined in the Crawler Scheduling section.



Crawler Scheduling

● Run on user request

○ Run every minutes

Note: This interval takes effect only after the crawler has run at least once

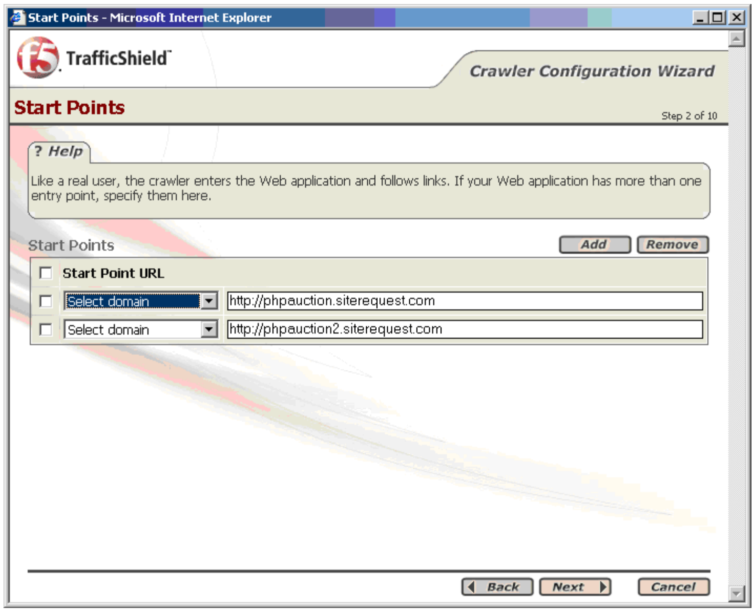
*To set a schedule:*

1. Select one of the following options:

| Option | Description |
|---|---|
| Run on user request | Select this option to run the Crawler whenever you want by clicking its Start button in the Build Tools section. |

| Option | Description |
|---|---|
| Run every... minutes | Select this option to automatically run the Crawler every x minutes. In the “Run every… minutes” box, enter the number of minutes. |

2. Click the Save button in the Crawler Scheduling window to continue or the Cancel button to exit the Wizard without saving.


Start Points - Microsoft Internet Explorer
TrafficShield
Crawler Configuration Wizard
Add
Remove
Back
Next
Cancel

Start Points

Step 2 of 10

? Help

Like a real user, the crawler enters the Web application and follows links. If your Web application has more than one entry point, specify them here.

Start Points

| □ | Start Point URL | |
|---|---|---|
| □ | Select domain ▾ | http://phpauction.siterequest.com |
| □ | Select domain ▾ | http://phpauction2.siterequest.com |

## Start Points

The Crawler starts the data collection process from a URL, this is the Start Point.

The start point is usually the Web application’s home page. However, you may instruct the Crawler to start scanning sections of the application from other points as well, in case the application includes sub-applications that cannot be accessed through the home page, but only directly from a sub-URL.

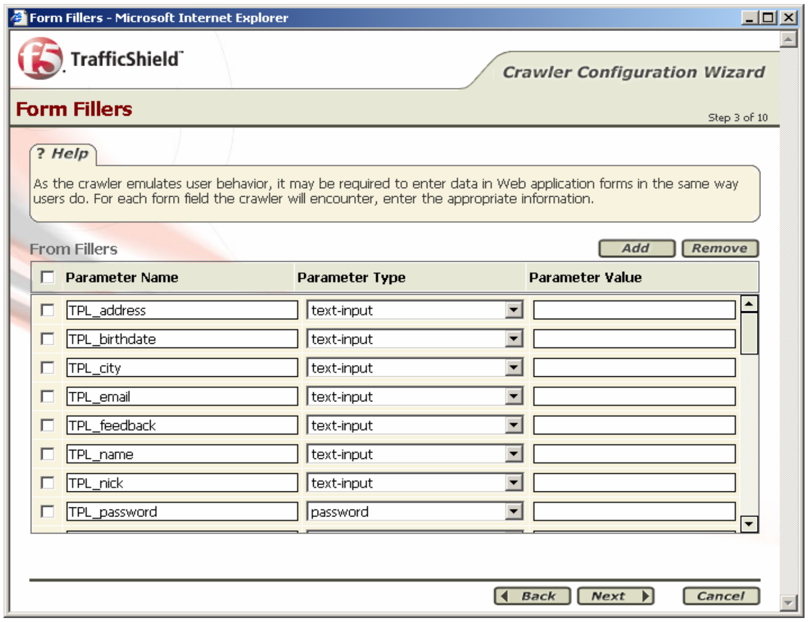
*To add Crawler starting points:*

1. Click Add. A new line is added to start points list. The Add New Crawler Start Point dialog box opens.
2. In the Domains drop down list, select the domain to which the start point belongs.

   A start point can be specified either as part of this Web application’s Fully Qualified Domain Name, or as part of one of its aliases. Select the domain or the alias to use. You must make a selection.

   The selected domain or alias appears in the Start Point text field.
3. Add the start point (a file name) to the end of the domain or alias string in the Start Point text field.

   The resulting string must be a valid path specification, or it will be rejected.
4. Repeat this procedure to define all relevant starting points.



As the crawler emulates user behavior, it may be required to enter data in Web application forms in the same way users do. For each form field the crawler will encounter, enter the appropriate information.

| □ | Parameter Name | Parameter Type | Parameter Value |
|---|---|---|---|
| □ | TPL_address | text-input | |
| □ | TPL_birthdate | text-input | |
| □ | TPL_city | text-input | |
| □ | TPL_email | text-input | |
| □ | TPL_feedback | text-input | |
| □ | TPL_name | text-input | |
| □ | TPL_nick | text-input | |
| □ | TPL_password | password | |

## Form Filler

Since the Crawler emulates user behavior, it submits data, in Web application pages, in the same way users do.

Each time the Crawler is activated, it populates the Form Filler Parameters Table with previously undefined parameter names.

If this is the first time you start the Crawler, all parameters are new to the Crawler and therefore it will most likely fail to submit any forms.

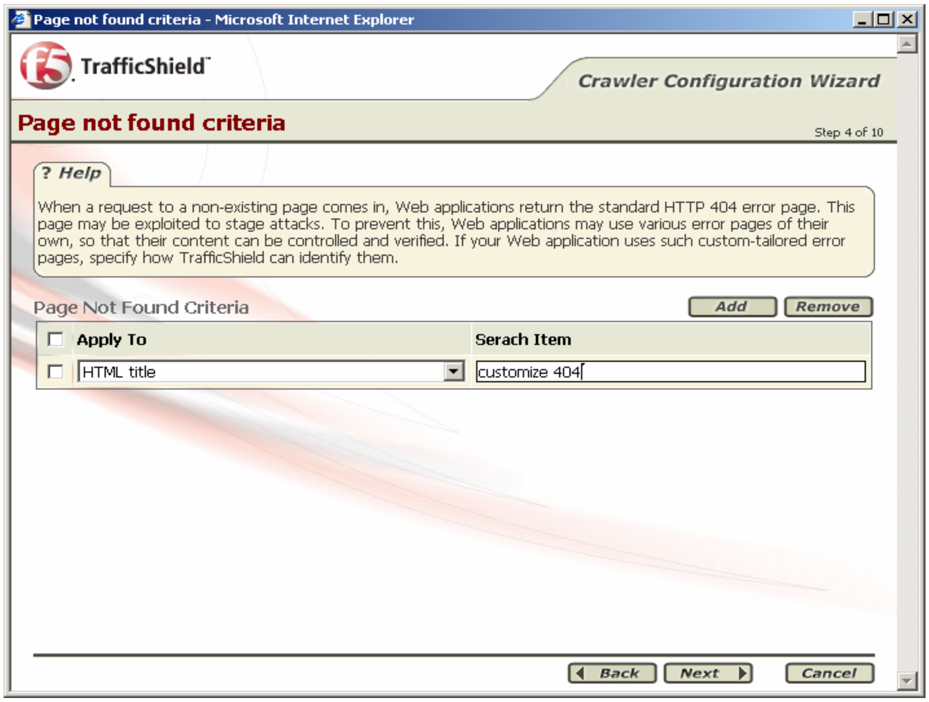
The next logical stage is to enter the crucial values needed to properly submit forms, for example: username, passwords, etc. Sometimes the fields' names are not self-explanatory and you will need to consult the web application programmer.

If you know what crucial parameters and values should be defined before running the Crawler the first time, you can enter them to help the Crawler utilize the Web application on the first run.

To use this feature, you specify the names and data types of the fields as well as the values the Crawler should enter in them.

*To add a customized parameter:*

1. In the Custom Parameters section, click the Add button and an empty line is displayed.
2. In the Parameter Name and Parameter Type, specify the name of the field and its data type.
3. In the Parameter Value, specify the value you want the Crawler to enter in the field.
4. Click OK.


Page not found criteria - Microsoft Internet Explorer
TrafficShield
Crawler Configuration Wizard
Step 4 of 10
? Help
Add
Remove
Back
Next
Cancel

Page not found criteria

When a request to a non-existing page comes in, Web applications return the standard HTTP 404 error page. This page may be exploited to stage attacks. To prevent this, Web applications may use various error pages of their own, so that their content can be controlled and verified. If your Web application uses such custom-tailored error pages, specify how TrafficShield can identify them.

Page Not Found Criteria

| □ | Apply To | Serach Item |
|---|---|---|
| □ | HTML title | customize 404 |

## Page Not Found Criteria

When a request to a non-existing page comes in, Web applications return the standard HTTP 404 error page. This page may be exploited to stage attacks. To prevent this, some Web applications may use error pages of their own that don’t return the HTTP 404 status code. They do this so that their content can be controlled and verified.

If your Web application uses such custom-tailored error pages, you need to supply a text string that the pages contain, so that the Crawler can identify them as a valid error message page and add it to the policy. If the “page not found” criteria is not defined, the Crawler will attempt to identify it by itself.

When an error occurs, the policy makes sure that only an error page whose content is recognized is returned to the request’s sender.

TrafficShield security application can recognize an error page by its filename or by text included in its <TITLE> or <BODY>.

**Tip**

In re-direct cases: The Crawler always follows the re-direct link. The Crawler identifies the page behind the link and avoids the link if the identified page is included in the Page Not Found list.

*To identify a customized error page:*

1. Click the Add button. A new empty line of page not found criteria is added.
2. In "Apply to", select one of the following options:

| Select | To identify the error page by |
|---|---|
| Full Object Name | Its full file name. In Search Item, enter the file name. |
| HTML Title | The text entered in its <TITLE> section. In Search Item, enter the text. |
| HTML Body | Any string of text that appears in its <BODY> section. In Search Item, type the string. |

3. And in “Search Item,” enter the indicated value and click OK.

## Logout Pages

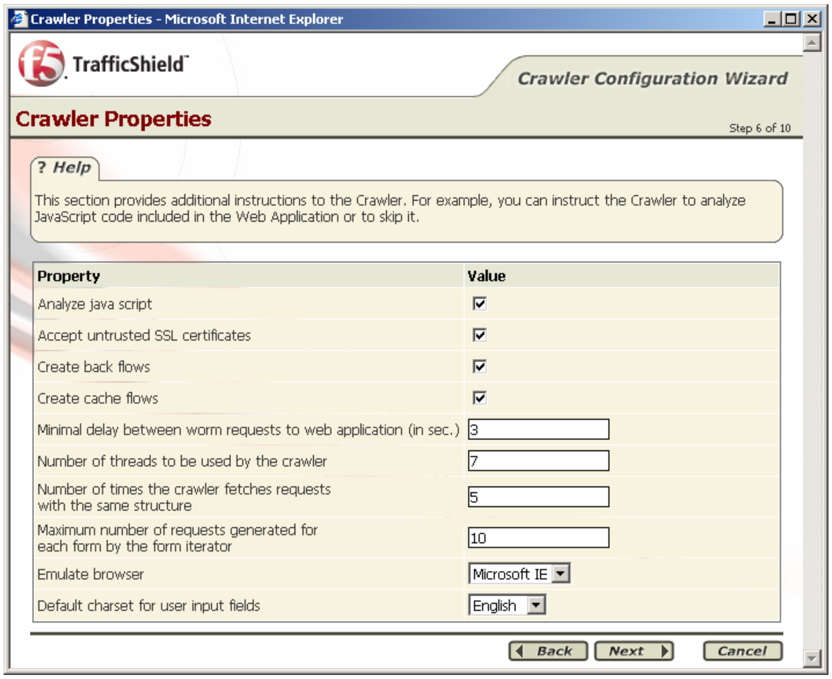
If the Web application contains a page designed to log the Web application visitor out, you need to instruct the Crawler not to follow the logout link as this will cause the Crawler to log out of the application before has fully scanned the application. In fact, many Web applications have an “exit” or “logout” link right in their home page, which would cause the Crawler to exit as soon as it enters the application. To prevent this, use the Logout Pages section to identify the logout points that the Crawler should avoid.

**Note**

The logout page will be added to the policy

*To define a logout point:*

1. Click the Add button. A new empty line of Logout Pages is added.
2. In "Logout Pattern (URL)", enter the relative path of the logout page.
3. Click OK


Crawler Properties - Microsoft Internet Explorer
TrafficShield
Crawler Configuration Wizard
Back
Next
Cancel

Crawler Properties

Step 6 of 10

? Help

This section provides additional instructions to the Crawler. For example, you can instruct the Crawler to analyze JavaScript code included in the Web Application or to skip it.

| Property | Value |
|---|---|
| Analyze java script | ☑ |
| Accept untrusted SSL certificates | ☑ |
| Create back flows | ☑ |
| Create cache flows | ☑ |
| Minimal delay between worm requests to web application (in sec.) | 3 |
| Number of threads to be used by the crawler | 7 |
| Number of times the crawler fetches requests with the same structure | 5 |
| Maximum number of requests generated for each form by the form iterator | 10 |
| Emulate browser | Microsoft IE |
| Default charset for user input fields | English |

## Properties

The Properties section provides additional instructions to the Crawler. For example, you can instruct the Crawler to analyze JavaScript code included in the Web Application or to skip it.

Enter the following information. Click the Save button in the Properties window to save your entries.

### Analyze JavaScript

Check this box to instruct the Crawler to analyze the JavaScript code included in the Web application. This is useful if the scripts contain links that can be followed, or if they include fields that need to be filled.
Clear the box if JavaScript analysis is not necessary.

**Accept un-trusted SSL certificates**

An un-trusted SSL certificate is used by the Web application and this checkbox option is checked, the Crawler accepts the SSL certificate and continues scanning.

Clear this box to instruct the Crawler to accept only trusted certificates.

**Create Back Flows**

As the Crawler runs, it always registers the page that follows a certain page over a link, thus adding the application flows to the policy. You can access each such flow definition and further configure it in order to establish rules of passage from one page to another.

By checking this box, you instruct the Crawler to also register in the policy all flows in the opposite direction, in which case you can also impose rules on navigating backwards (which occurs when the visitor uses the Back button).

**Create Cache Flows**

Cache flows are created around cacheable objects. The flow is created from the first non-cacheable referrer object around the cacheable object. The parameters of the incoming flow will be added to the newly created cache flow.

When no previous non-cacheable referrer object is found, the cacheable object itself becomes the entry point and the flow is added.

**Min. delay between worm requests to Web application (in sec.)**

The Crawler is a mechanism that can be likened to a central unit sending out multiple probes to the different areas of the Web application in order to register Web application components simultaneously. Each probe behaves as if it were a real user, following links and filling in forms, and therefore increases traffic.

The probes can be sent in quick or slow succession. Quicker bursts create more traffic. A burst is measured in terms of the number of seconds to wait before sending the next probe. If your Web application is active and currently serving visitors, consider increasing this value in order to slow down the Crawler.

#### Number of threads to be used by the Crawler

This parameter also relates to simultaneous probe activity. A smaller number decreases the Crawler's bandwidth consumption, leaving more bandwidth to actual visitors.

### Number of times the Crawler fetches requests with the same structure

Applications usually have many identical structures where only the parameter values differ. The following examples illustrate identical links passing different parameter values:

http://www.myapp.htm?par=111
http://www.myapp.htm?par=222
http://www.myapp.htm?par=333

To reduce crawling time and traffic you can instruct the Crawler to scan only a few of such identical structures and not all of them, assuming that all others behave in the same way.

Specify the number of samples you deem it sufficient for the Crawler to scan. A higher value yields a more accurate policy with longer crawling times.

### Maximum number of requests generated for each form by the form iterator

When the Crawler encounters a form, it processes it as many times as the number of pre-defined parameter values included in it. For example, a drop-down list containing ten values causes the Crawler to process the form ten times, each time with a different value. However, you can reduce crawling time and traffic by instructing the Crawler to process only a few of the values and not all of them.

Specify the number of samples you deem it sufficient for the Crawler to process from the same form with different values. A higher value yields a more accurate policy with longer crawling times.

#### Emulate browser

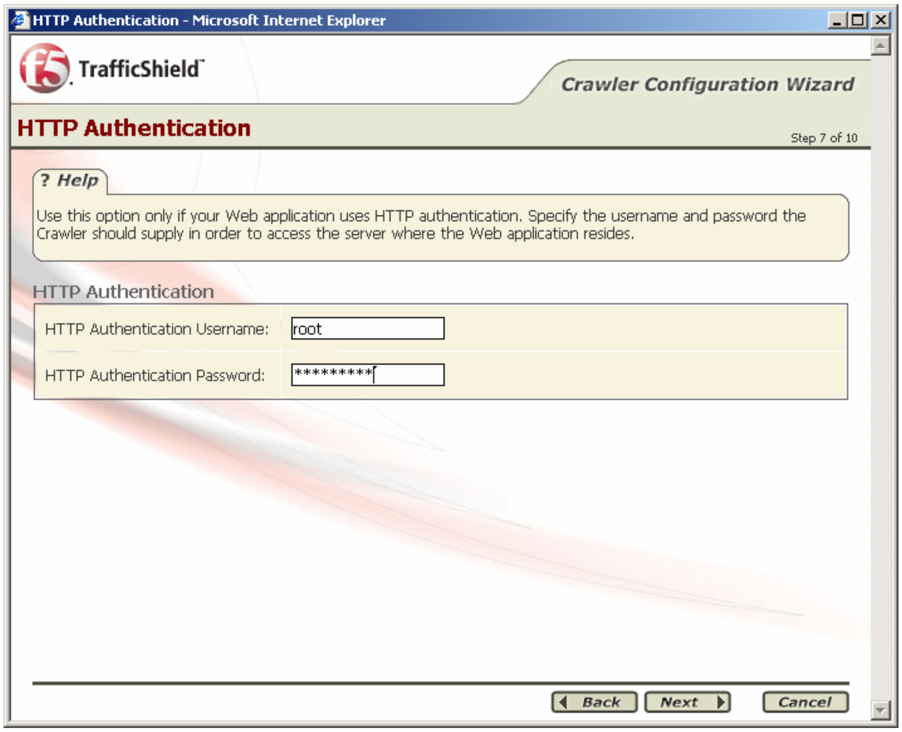
If your Web application is set to work only with a given Internet browser, set the relevant browser name.

This name will be used to select the user-agent header data.

**Default CharSet for user input fields**
Select the character set in which data is normally entered in the form fields of the scanned application. This value will be used as the default value for all new policy fields added by the Crawler.

## HTTP Authentication

Use this option only if your Web application uses HTTP authentication.


HTTP Authentication - Microsoft Internet Explorer
TrafficShield™
Crawler Configuration Wizard
HTTP Authentication
Step 7 of 10
? Help

Use this option only if your Web application uses HTTP authentication. Specify the username and password the Crawler should supply in order to access the server where the Web application resides.

HTTP Authentication

HTTP Authentication Username: root

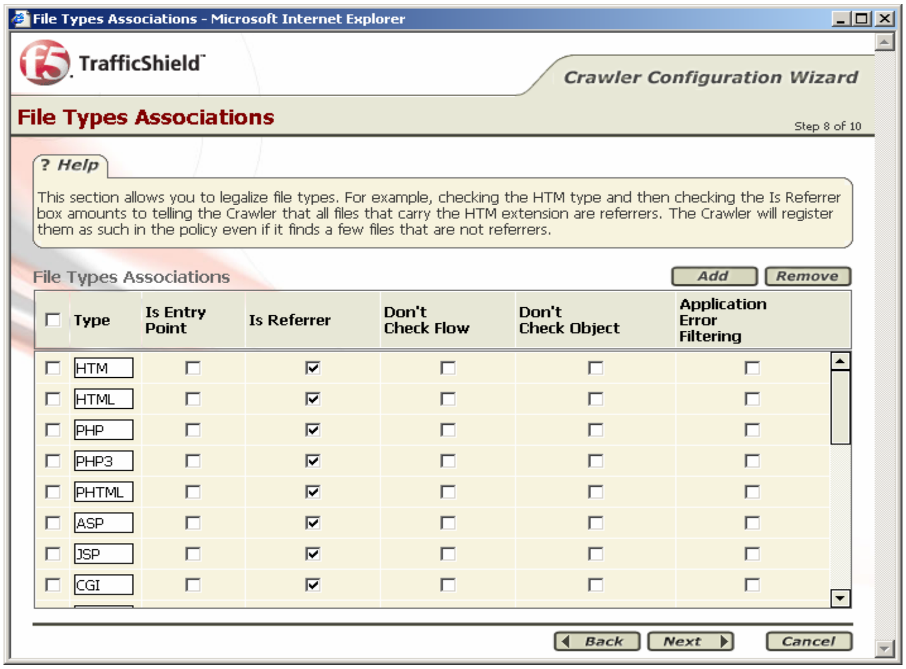
HTTP Authentication Password: *********

Specify the user name and password the Crawler should supply in order to access the server where the Web application resides.

## File Type Associations

This section provides a list of file types frequently used in a Web application and their most common usage in the Web application.

It allows you to configure file types globally, thus saving tedious manual configuration in the policy. For example, you can instruct the Crawler to define all BMP files as files that do not have a flow.



File Types Associations - Microsoft Internet Explorer
TrafficShield
Crawler Configuration Wizard

File Types Associations

Step 8 of 10

? Help

This section allows you to legalize file types. For example, checking the HTM type and then checking the Is Referrer box amounts to telling the Crawler that all files that carry the HTM extension are referrers. The Crawler will register them as such in the policy even if it finds a few files that are not referrers.

File Types Associations

| □ | Type | Is Entry Point | Is Referrer | Don't Check Flow | Don't Check Object | Application Error Filtering |
|---|---|---|---|---|---|---|
| □ | HTM | □ | ☑ | □ | □ | □ |
| □ | HTML | □ | ☑ | □ | □ | □ |
| □ | PHP | □ | ☑ | □ | □ | □ |
| □ | PHP3 | □ | ☑ | □ | □ | □ |
| □ | PHTML | □ | ☑ | □ | □ | □ |
| □ | ASP | □ | ☑ | □ | □ | □ |
| □ | JSP | □ | ☑ | □ | □ | □ |
| □ | CGI | □ | ☑ | □ | □ | □ |

If the list does not include a file type, you need to configure it.

- Click the Add button, add a file extension, and click OK.

The defaults provided in this page cover the most plausible eventualities, but you can adapt them to you needs by checking or clearing boxes.

A description of the file type configuration parameters follows.

**Is Entry Point**

Check this box if all files of this type can be entry points to the Web application.

**Is Referrer**

Check this box if objects of this object type may refer to other files. For example, HTML pages containing a link or CGI files calling another file, are referrers. Pictures and sound files cannot be referrers because these objects never contain links to other objects and are not web pages.

**Don’t Check Flow**
Check this box if you don’t want the system to check the flows to objects of this file type.

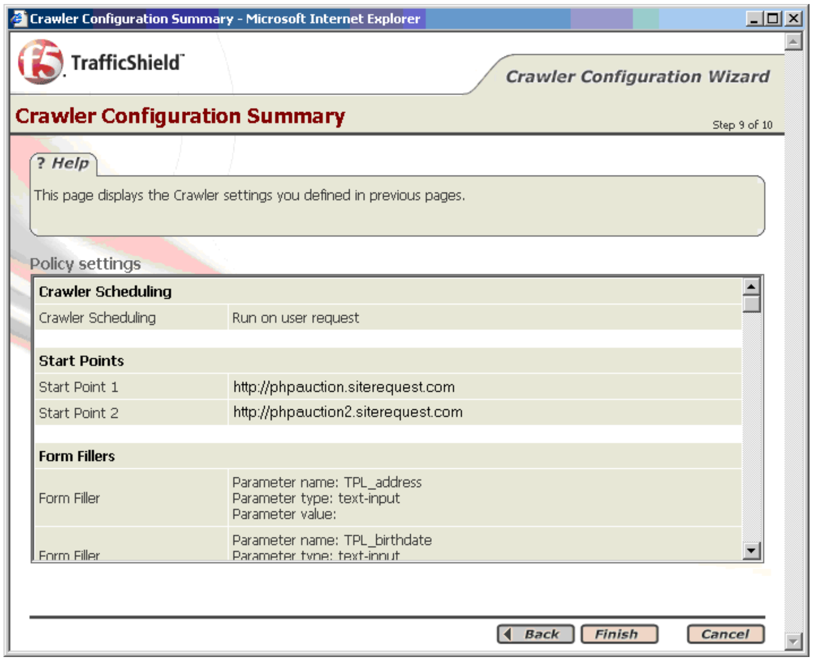
**Don’t Check Object**
Check this box to if you don’t want the system to check the requests referring to files of this type.

NOTE: This will also be applied to files that do not exist in the application.

## Crawler configuration Settings

This page displays the Crawler settings you defined in previous pages.

To modify the configuration click the Back button until you reach the relevant step, and modify the data.


Crawler Configuration Summary - Microsoft Internet Explorer
TrafficShield
Crawler Configuration Wizard
? Help
Back
Finish
Cancel

Crawler Configuration Summary

Step 9 of 10

This page displays the Crawler settings you defined in previous pages.

Policy settings

| | |
|---|---|
| **Crawler Scheduling** | |
| Crawler Scheduling | Run on user request |
| **Start Points** | |
| Start Point 1 | http://phpauction.siterequest.com |
| Start Point 2 | http://phpauction2.siterequest.com |
| **Form Fillers** | |
| Form Filler | Parameter name: TPL_address<br>Parameter type: text-input<br>Parameter value: |
| Form Filler | Parameter name: TPL_birthdate<br>Parameter type: text-input |

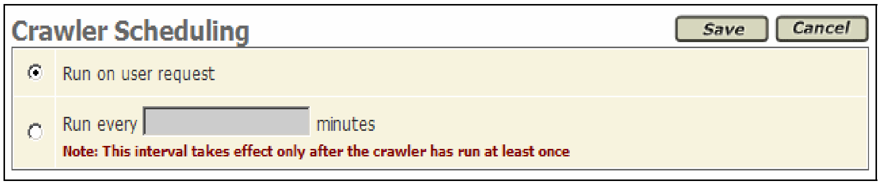
*To manually configure the Crawler:*

1. Click the Settings button. The Crawler settings window appears. Each group of parameters is displayed in a separate box.

2. Enter the Crawler settings as described in the subsequent sections.
3. Return to Policy Properties by clicking the Back ⬅ button, found on the upper left side of the policy properties window.

## Crawler Scheduling

You can run the Crawler manually, or you can set the Crawler to run periodically. This is defined in the Crawler Scheduling section.



Crawler Scheduling

● Run on user request

○ Run every ______ minutes

Note: This interval takes effect only after the crawler has run at least once

*To set a schedule:*

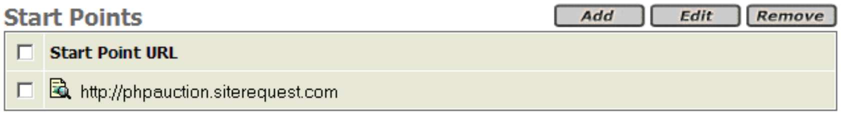
1. Select one of the following options:

| Option | Description |
|---|---|
| Run on user request | Select this option to run the Crawler whenever you want by clicking its Start button in the Build Tools section. |
| Run every... minutes | Select this option to automatically run the Crawler every x minutes. In the “Run every” box, enter the number of minutes. |

2. Click the Save button in the Crawler Scheduling window.

## Starting Points

The start point is a URL from which the Crawler starts the data collection process.



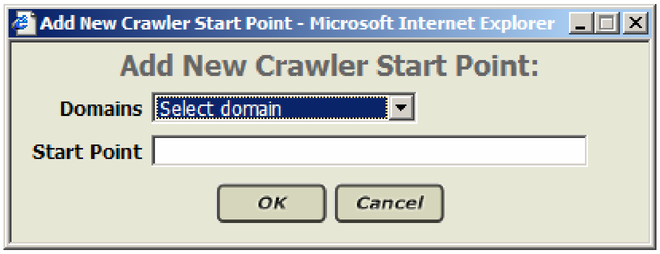
| □ | Start Point URL |
|---|---|
| □ | http://phpauction.siterequest.com |

The start point is usually the application's home page. However, you may instruct the Crawler to start scanning sections of the application from other points as well in case the application includes sub-applications that cannot be accessed through the home page, but only directly from a sub-URL.

*To add Crawler starting points:*

1. Click the Add button in the Start Points section.

   The Add New Crawler Start Point dialog box opens.



Add New Crawler Start Point:

Domains: Select domain

Start Point:

2. In the Domains drop down list, select the domain to which the starting point belongs.

   - A start point can be specified either as part of this Web application's Fully Qualified Domain Name or as part of one of its aliases. Select the domain or the alias to use. You must make a selection.

   - The selected domain or alias appears in the Start Point text field.

3. Add the starting point (a file name) to the end of the domain or alias string in the Start Point text field.

   The resulting string must be a valid path specification or it will be rejected.

4. Repeat this procedure to define all relevant starting points.

## Form Filler

Since the Crawler emulates user behavior, it submits data, in Web application pages, in the same way users do.

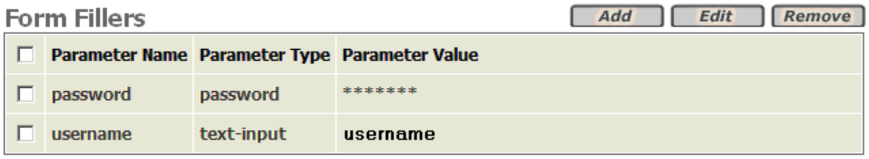
Every time the Crawler is started, it populates the Form Filler Parameters Table with previously undefined parameter names.

If this is the first time you start the Crawler, all parameters are new to the Crawler and therefore it will most likely fail to submit any forms.

The next logical stage is to enter the crucial values needed to properly submit forms, for example: username, passwords, etc. Sometimes the fields’ names are not self-explanatory and you will need to consult the web application programmer.

If you know what crucial parameters and values should be defined before running the Crawler the first time, you can enter them to help the Crawler utilize the Web application on the first run.

To use this feature, you specify the names and data types of the fields as well as the values the Crawler should enter in them.

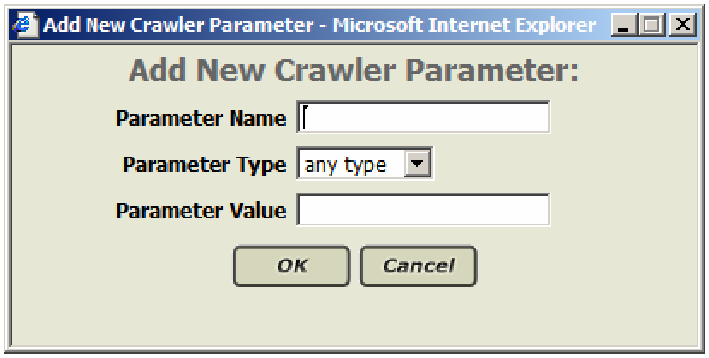


| □ | Parameter Name | Parameter Type | Parameter Value |
|---|---|---|---|
| □ | password | password | ******* |
| □ | username | text-input | username |

*To add a customized parameter:*

1. In the Custom Parameters section, click the Add button.

   The Add New Crawler Parameter dialog box opens.


Add New Crawler Parameter - Microsoft Internet Explorer
Add New Crawler Parameter:
OK
Cancel

Parameter Name

Parameter Type: any type

Parameter Value

2. In Parameter Name and Parameter Type, specify the name of the field and its data type.
3. In Parameter Value, specify the value you want the Crawler to enter in the field.

   Tip: If the parameter in question is a password type you will be asked to enter the value twice. The value will not be displayed.
4. Click OK.

## Page Not Found Criteria

When a request to a non-existing page comes in, Web applications return the standard HTTP 404 error page. This page may be exploited to stage attacks. To prevent this, some Web applications may use error pages of their own that don't return the HTTP 404 status code. They do this so that their content can be controlled and verified.

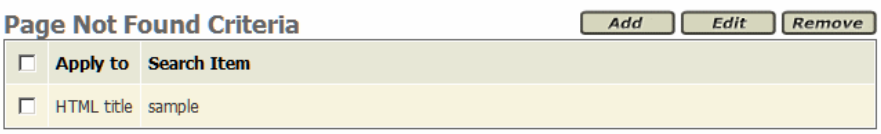
If your Web application uses such custom-tailored error pages, you need to supply a text string that the pages contain, so that the Crawler can identify them as a valid error message page and add it to the policy. If the "page not found" criteria is not defined, the Crawler will attempt to identify it by itself.

When an error occurs, the policy makes sure that only an error page whose content is recognized is returned to the request’s sender.

TrafficShield security application can recognize an error page by its filename or by text included in its <TITLE> or <BODY>.

**Tip:**

In re-direct cases: The Crawler always follows the re-direct link. The Crawler identifies the page behind the link and avoids the link if the identified page is included in the Page Not Found list.

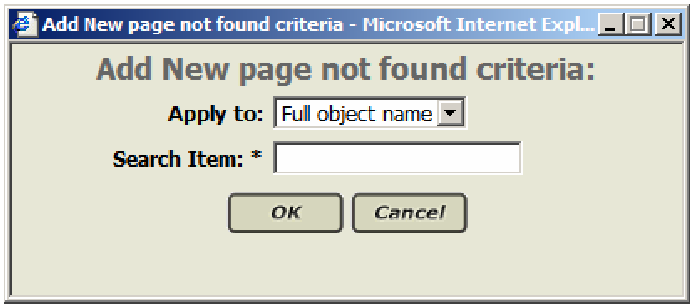


| □ | Apply to | Search Item |
|---|---|---|
| □ | HTML title | sample |

*To identify a customized error page:*

1. In the Page Not Found Criteria section, click the Add button.

   The "Add new page not found criteria" box opens.


Add New page not found criteria - Microsoft Internet Expl...
OK
Cancel

Add New page not found criteria:

Apply to: Full object name

Search Item: *

2. In "Apply to", select one of the following options, and in Search Item enter the indicated value.

| Select | To identify the error page by |
|---|---|
| Full Object Name | Its full file name. In Search Item, enter the file name. |
| HTML Title | The text entered in its <TITLE> section. In Search Item, enter the text. |

| Select | To identify the error page by |
|---|---|
| HTML Body | Any string of text that appears in its <BODY> section. In Search Item, type the string. |

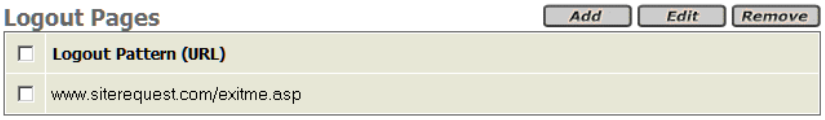
3. Click OK.

## Logout Pages

If the Web application contains a page designed to log the Web application visitor out, you need to instruct the Crawler not to follow the logout link, as this will cause the Crawler to log out of the application before it was fully scanned. In fact, many Web applications have an “exit” or “logout” link right in their home page, which would cause the Crawler to exit as soon as it enters the application. To prevent this, use the Logout Pages section to identify the logout points that the Crawler should avoid.

**Tip**

The logout page will be added to the policy

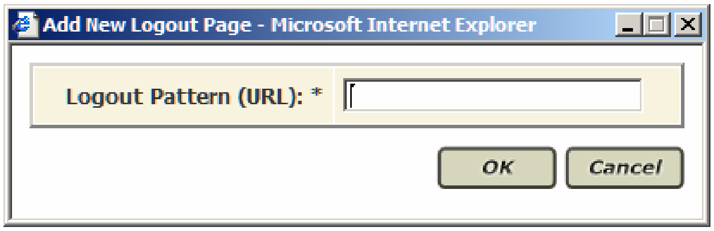


| | |
|---|---|
| □ | Logout Pattern (URL) |
| □ | www.siterequest.com/exitme.asp |

*To define a logout point*

1. In the Logout Pages section, click the Add button.

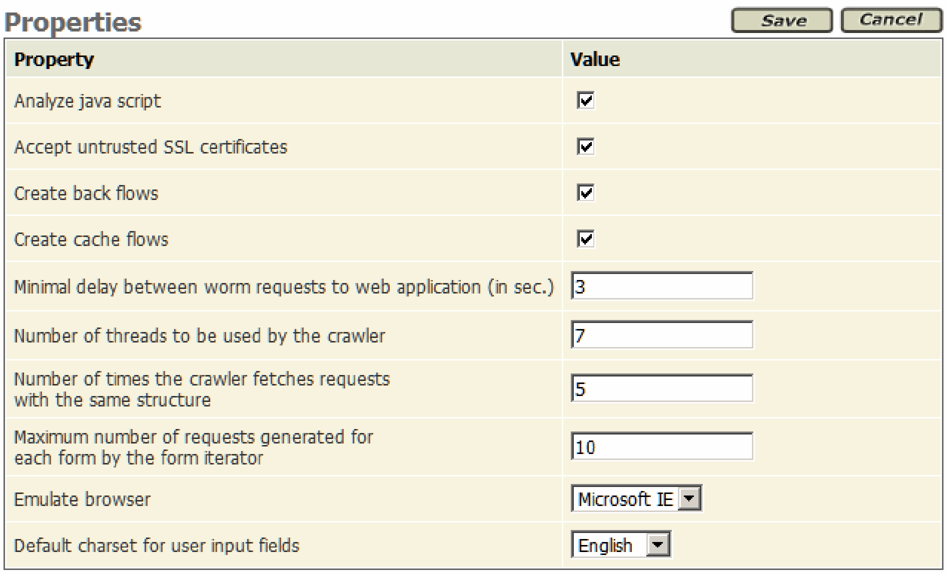
   The "Add new logout page" box opens.



2. In "Logout Pattern (URL)", enter the relative path of the logout page.
3. Click OK.

## Properties

The Properties section provides additional instructions to the Crawler. For example, you can instruct the Crawler to analyze JavaScript code included in the Web Application or to skip it.



| Property | Value |
|---|---|
| Analyze java script | ☑ |
| Accept untrusted SSL certificates | ☑ |
| Create back flows | ☑ |
| Create cache flows | ☑ |
| Minimal delay between worm requests to web application (in sec.) | 3 |
| Number of threads to be used by the crawler | 7 |
| Number of times the crawler fetches requests with the same structure | 5 |
| Maximum number of requests generated for each form by the form iterator | 10 |
| Emulate browser | Microsoft IE |
| Default charset for user input fields | English |

Enter the following information. Click the Save button in the Properties window to save your entries.

#### Analyze JavaScript

Check this box to instruct the Crawler to analyze the JavaScript code included in the Web application. This is useful if the scripts contain links that can be followed or if they include fields that need to be filled.

Clear the box if JavaScript analysis is not necessary.

#### Accept un-trusted SSL certificates

An un-trusted SSL certificate is used by the Web application and this checkbox option is checked, the Crawler will accept the SSL certificate and continue scanning.

Clear this box to instruct the Crawler to accept only trusted certificates.

**Create Back Flows**

As the Crawler runs, it always registers the page that follows a certain page over a link, thus adding the application flows to the policy. You can access each such flow definition and further configure it in order to establish rules of passage from one page to another.

By checking this box you instruct the Crawler to also register in the policy all flows in the opposite direction, in which case you can also impose rules on navigating backwards (which occurs when the visitor uses the Back button).

**Create Cache Flows**

Cache flows are created around cacheable objects. The flow is created from the first non-cacheable referrer object around the cacheable object. The parameters of the incoming flow will be added to the newly created cache flow.

When no previous non-cacheable referrer object is found, the cacheable object itself becomes the entry point and the flow is added.

**Min. delay between worm requests to Web application (in sec.)**

The Crawler is a mechanism that can be likened to a central unit sending out multiple probes to the different areas of the Web application in order to register Web application components simultaneously. Each probe behaves as if it were a real user, following links and filling in forms, and therefore increases traffic.

The probes can be sent in quick or slow succession. Quicker bursts create more traffic. A burst is measured in terms of the number of seconds to wait before sending the next probe. If your Web application is active and currently serving visitors, consider increasing this value in order to slow down the Crawler.

**Number of threads to be used by the Crawler**

This parameter too relates to simultaneous probe activity. A smaller number decreases the Crawler’s bandwidth consumption leaving more bandwidth to actual visitors.

### Number of times the Crawler fetches requests with the same structure

Applications usually have many identical structures where only the parameter values differ. The following examples illustrate identical links passing different parameter values:

http://www.myapp.htm?par=111
http://www.myapp.htm?par=222
http://www.myapp.htm?par=333

To reduce crawling time and traffic you can instruct the Crawler to scan only a few of such identical structures and not all of them, assuming that all others behave in the same way.

Specify the number of samples you deem it sufficient for the Crawler to scan. A higher value yields a more accurate policy with longer crawling times.

### Maximum number of requests generated for each form by the form iterator

When the Crawler encounters a form, it processes it as many times as the number of pre-defined parameter values included in it. For example, a drop-down list containing ten values causes the Crawler to process the form ten times, each time with a different value. However, you can reduce crawling time and traffic by instructing the Crawler to process only a few of the values and not all of them.

Specify the number of samples you deem it sufficient for the Crawler to process the same form with different values. A higher value yields a more accurate policy with longer crawling times.

### Emulate browser

If your Web application is set to work only with a given Internet browser, set the relevant browser name.

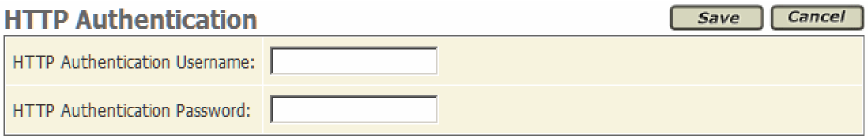
This name will be used to select the user-agent header data.

### Default CharSet for user input fields

Select the character set in which data is normally entered in the form fields of the scanned application. This value will be used as the default value for all new policy fields added by the Crawler.

## HTTP Authentication

Use this option only if your Web application uses HTTP authentication.



HTTP Authentication

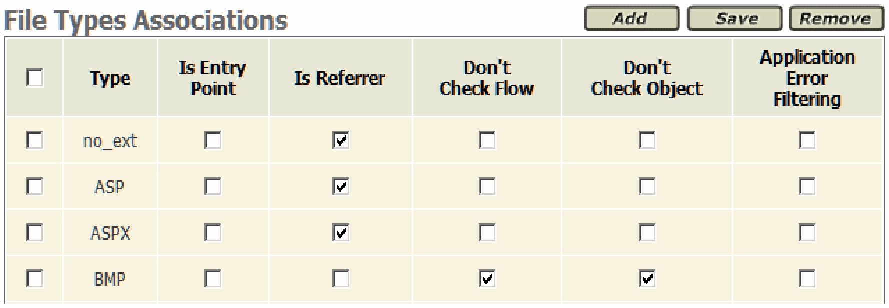
|  |  |
|---|---|
| HTTP Authentication Username: |  |
| HTTP Authentication Password: |  |

Specify the user name and password the Crawler should supply in order to access the server where the Web application resides.

## File Type Associations

This section provides a list of file types frequently used in a Web application and their most common usage in the Web application.

It allows you to configure file types globally, thus saving tedious manual configuration in the policy. For example, you can instruct the Crawler to define *all* BMP files as files that do not have a flow.



File Types Associations

| □ | Type | Is Entry Point | Is Referrer | Don't Check Flow | Don't Check Object | Application Error Filtering |
|---|---|---|---|---|---|---|
| □ | no_ext | □ | ☑ | □ | □ | □ |
| □ | ASP | □ | ☑ | □ | □ | □ |
| □ | ASPX | □ | ☑ | □ | □ | □ |
| □ | BMP | □ | □ | ☑ | ☑ | □ |

If the list does no include a file type you need to configure, click the Add button, add a file extension, and click OK.

The defaults provided in this page cover the most plausible eventualities, but you can adapt them to you needs by checking or clearing boxes.

A description of the file type configuration parameters follows.

**Is Entry Point**

Check this box if all files of this type can be entry points to the Web application.

**Is Referrer**

Check this box if files of this type may refer to other files. For example, HTML pages containing a link or CGI files calling another file, are referrers. Pictures and sound files cannot be referrers.

**Don't Check Flow**

Check this box if you don't want the system to check the flows to objects of this file type.

**Don't Check Object**

Check this box to if you don't want the system to check the requests referring to files of this type.

NOTE: This will also be applied to files that do not exist in the application.

**Check Response**

If you check this box, responses to requests to files of this type will be checked against all negative regular expressions applied to "Server response data".

## Data Collection with Policy Browser

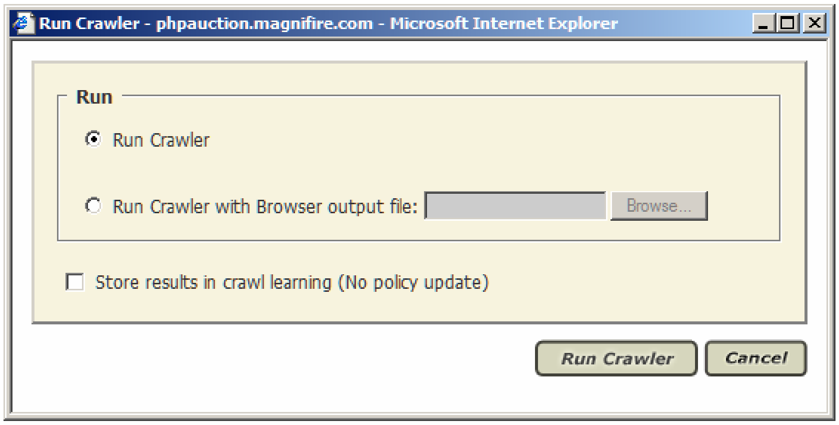
The Policy Browser collects data that the Crawler can later use as a sort of fine-tuning input. The Policy Browser also overcomes browsing obstacles.

The data is collected by simply browsing the application as you would browse it with a regular browser. The browsing information processed by the browser is stored in a file. It is advisable to use the Policy Browser extensively and let it collect as much data as possible to later help the Crawler create a more accurate policy.

For instructions on how to download the policy browser and how to create the input file refer to the Downloads section of Chapter 5 in the *Configuration and Installation Manual*.

*To Manually Start the Crawler*

1. Select the relevant policy for which the Crawler settings will apply, from the Policy Management->Policies List.
2. Open the policy for editing by selecting the policy you want to work on and clicking on the Policy Properties tab or the EDIT button.
3. In Build Tools, click the Crawler's Start button.
   The Run Crawler dialog box opens.


Run Crawler - phpauction.magnifire.com - Microsoft Internet Explorer
Run
Browse...
Run Crawler
Cancel

● Run Crawler

○ Run Crawler with Browser output file:

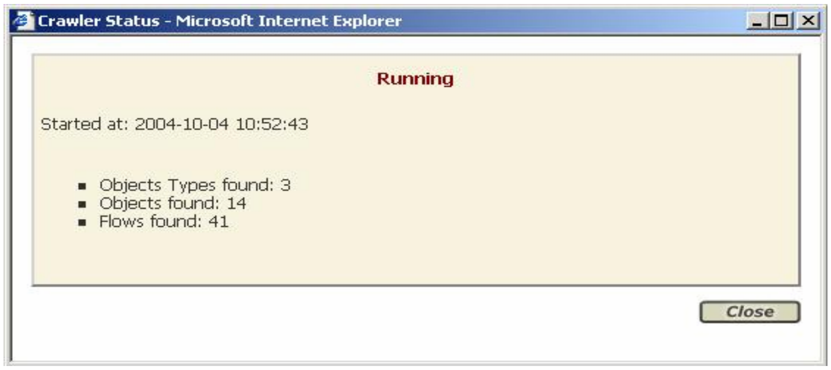
□ Store results in crawl learning (No policy update)

**Run Crawler**
Choosing this radio button runs the Crawler as is, without the additional information supplied by the Policy Browser.

**Run Crawler with policy browser output file**
Run the Crawler and also use Web application details pre-recorded by the Policy Browser. Click the Browse button and select the Policy Browser's output file. For additional information on how such a file is created please refer to the Data Collection section in this Chapter.

**Store results in crawl learning (No policy update)**
Check this checkbox to activate the Crawler Learning process. Please refer to the Crawler Learning section at the end of this chapter. Click the Run Crawler button. The Crawler starts collecting data.

While the Crawler is running, you can click the Status button to open a window where you can see how the operation is progressing.



Running

Started at: 2004-10-04 10:52:43

- Objects Types found: 3
- Objects found: 14
- Flows found: 41

The message "Running" appears at the top of the window while the Crawler is still running. During this time, the dialog box displays the number of objects and flows that have been scanned and identified. Click the Status button to display the current status, without waiting for the next automatic refresh operation. The status window title changes to "Finished" when the operation ends. You can also monitor the process by accessing the other tabs in the navigation bar on the left.

## Policy-Specific Negative Regular Expressions

When you create a new policy, the policy automatically inherits all of the negative regular expressions defined in the Administration module, and these expressions are listed in this tab. Existing policies do not inherit expressions that have been created after them. You can add policy-specific negative regular expressions by choosing the tab under Configuration->Negative RegExp and add them just like adding default Regular Expression. For details, see Chapter 5 – Administration in the Single-Unit Installation and Configuration Manual.

**Tip**

Violations created due to Negative Regular Expressions are related to illegal pattern violations.

# Setting the Active Policy of a Web Application

At any given time, TrafficShield security application enforces only one of the available security policies. The security policy according to which the Web application is currently protected is called the *active* security policy.

You need to set the active security policy in the following cases:

- Before opening the Web application to user traffic, for testing or for regular business.
- Every time that you enter a change in the policy. If you do not re-activate the policy, the latest changes are not reflected to the Web application. A policy that has not been activated after it has been modified is marked with the M icon.
- Whenever you switch from one policy to another.

*To activate a policy:*

1. Select the Administration button.
2. Click the Web Applications tab.

   The defined Web applications are listed.
3. In the Active Policy drop-down list, select the security policy to apply to the Web application.

   When you select a policy, TrafficShield security application automatically selects the Web application by marking its radio button.
4. Click the Set Active Policy button.

# Crawler Learning

This section explains how to use the Crawler Learning module and how to adapt the policy using the Crawler Learning's output.

The Crawler Learning enables the user to scan the Web application in a learning mode.

When we use the Crawler in a non-learning mode, the crawler populates the policy with the new items.

When the Crawler is set to work in a Learning mode, it populates the crawler learning tables with the new items instead of directly populating the policy tables.

You can then review the data and accept object types, objects and flows that were found by the Crawler and then add or reject them.

Crawler learning tabs are identical to the Learning tabs. Both Learning and Crawler Learning populate the forensics section.

***First-time usage*: Crawler Learning can be used to update an existing policy or to initialize a policy. When updating a policy, the Crawler works in update mode and writes all the incrementally new items to the Crawler Learning tables. It doesn’t change the existing policy items. When populating an empty policy, all items appear in the Crawler learning tables. In both cases you need to accept the item if you want to add it to the policy*.

***Second Time Usage*: Unlike the regular Learning, once the Object is accepted and added to Configuration -> Web Objects tab, all relevant flows are not automatically added to the policy. In order to add the relevant flows, you will need to re-run the Crawler or the Crawler learning.

**Tip**

If an item is rejected permanently it is moved to Forensics >> Ignore Items. This affects the Learning stage as well. For more details, please refer to the Ignored Requests section in Chapter 6.

# Chapter 6 Learning - Testing and Fine-Tuning the Policy

After automatically generating a policy using the Crawler and making any manual changes needed, you are ready to test and refine the policy in real-life conditions, through the Learning module and the Policy editing tools.

This chapter explains how to use the Learning module to adapt the policy to real-life traffic requirements. It also covers the Policy editing feature, which allows you to view and manually adjust the entire security policy.

## Learning

The Learning module was created to fine tune the Crawler created security policies. This is relevant both for the first activation of the TrafficShield security application and as an ongoing tool as well.

In each case, the Learning screens are actually suggesting changes to the policy which would include all future requests of this nature. You can accept objects or flows that were rejected by the TrafficShield security application, and reject changes to the policy that were caused by actual attacks which were screened out.

**Tip**

Customize your blocking definitions to temporarily allow some violations to go through until the Learning fine-tuning is more complete.

*First-time usage:* As the Web application is new; you may prefer to run an initial test in safe conditions. Such conditions can be created by opening the Web application to a limited number of visitors like QA and employees of your organization (persons who are not potential hackers).

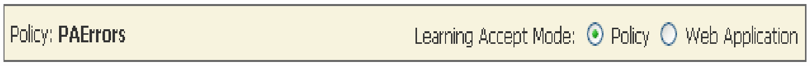
Initially, the alarms help you adjust policy attribute values until you are sure that the policy is usable. Any invalid request that might come after the Learning stage can justifiably be considered illegal and treated as such. In fact, after the initial testing period you can use the Learning module to track real attacks.

*Ongoing usage*: If the Web application to be protected is already in use, a portion of the live traffic can be diverted through the TrafficShield security application to the Learning module.

As visitors move through the Web application, the TrafficShield security application captures requests that contradict your current policy settings, and posts alarms to the Learning module pages.

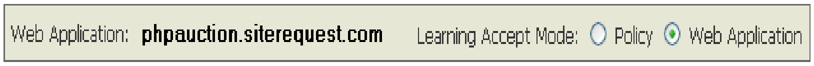
The Learning module checks that all objects that are supposed to exist in your Web application are indeed present (for example, all links lead to objects that exist in the Web application). It also checks that the attributes specified for policy objects, such as URI lengths or allowed meta-characters, are realistic.

In all the Learning windows, the fine-tuning changes can be applied to a specific Policy:



Policy: **PAErrors** Learning Accept Mode: ● Policy ○ Web Application

The Learning fine-tuning changes can also be applied to a Web application which will affect all related policies:



Web Application: **phpauction.siterequest.com** Learning Accept Mode: ○ Policy ● Web Application

## Learning Duration

The aim of the Learning process should be to generate traffic on all pages, to click all links, to fill all form fields, an so on. For new applications, standard QA routines can be used for Learning. For live applications, even a 15-minute test might supply valuable information that will help you fine-tune the policy. Obviously, the longer the test, the greater the opportunities to capture information that may help you establish a safer policy.

## Accessing the Learning Data

*To access the Learning data:*

- Choose the Policy Management-> Learning screen and then the relevant tab representing the policy component you wish to review.

**Note**

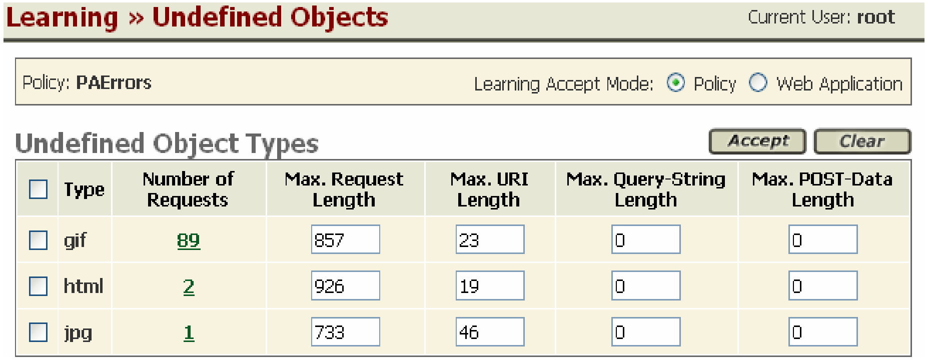
The Set Active Policy MUST be activated to incorporate all learning new definitions, therefore we strongly recommend that you activate the policy after all changes.

# Undefined Objects

This tab is divided into two parts; The Undefined Object Types and the Undefined Objects.

## Undefined Object Types

The Undefined Objects Types window lists information about requests that referenced object types not found in the Web application. The Object Type is considered undefined unless you define it in the Configuration -> Object Types tab.



Policy: PAErrors

Learning Accept Mode: ● Policy ○ Web Application

Undefined Object Types

| □ | Type | Number of Requests | Max. Request Length | Max. URI Length | Max. Query-String Length | Max. POST-Data Length |
|---|---|---|---|---|---|---|
| □ | gif | 89 | 857 | 23 | 0 | 0 |
| □ | html | 2 | 926 | 19 | 0 | 0 |
| □ | jpg | 1 | 733 | 46 | 0 | 0 |

**Select box column**

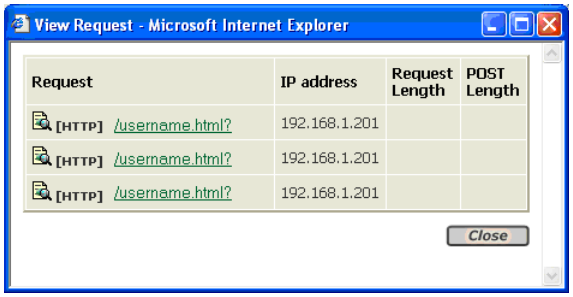
The first column contains checkboxes used to mark the relevant entry.

**Type**

Check the checkbox for the relevant Object (file) types that you want to add to the policy.

**Number of Requests**

This number indicates the number of requests that have been rejected for violating the identified object type definitions. You can click this number to receive a detailed list.

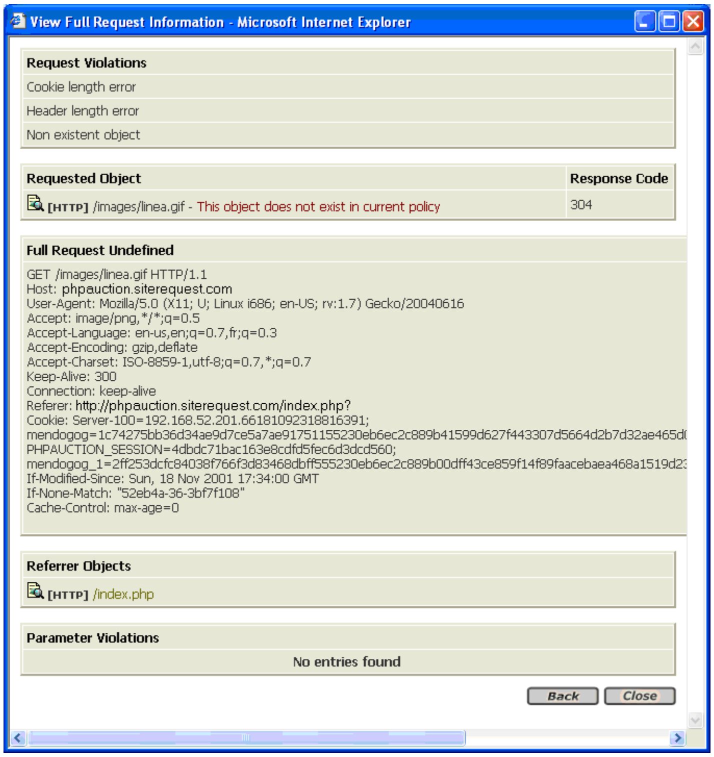


| Request | IP address | Request Length | POST Length |
|---|---|---|---|
| [HTTP] /username.html? | 192.168.1.201 | | |
| [HTTP] /username.html? | 192.168.1.201 | | |
| [HTTP] /username.html? | 192.168.1.201 | | |

**Note**

If this object type was chosen and the Accept button was clicked, the next time these requests are received, they will not be rejected for the undefined object type violation.

If you click on the link, a very detailed Full Request Information window will appear that contains all the technical details of all the violations related to the specific request. For more details please refer to the View Full Request Information section in the chapter.



| Request Violations |
|---|
| Cookie length error |
| Header length error |
| Non existent object |

| Requested Object | Response Code |
|---|---|
| [HTTP] /images/linea.gif - This object does not exist in current policy | 304 |

**Full Request Undefined**

```
GET /images/linea.gif HTTP/1.1
Host: phpauction.siterequest.com
User-Agent: Mozilla/5.0 (X11; U; Linux i686; en-US; rv:1.7) Gecko/20040616
Accept: image/png,*/*;q=0.5
Accept-Language: en-us,en;q=0.7,fr;q=0.3
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Referer: http://phpauction.siterequest.com/index.php?
Cookie: Server-100=192.168.52.201.66181092318816391;
mendogog=1c74275bb36d34ae9d7ce5a7ae91751155230eb6ec2c889b41599d627f443307d5664d2b7d32ae465d
PHPAUCTION_SESSION=4dbdc71bac163e8cdfd5fec6d3dcd560;
mendogog_1=2ff253dcfc84038f766f3d83468dbff555230eb6ec2c889b00dff43ce859f14f89faacebaea468a1519d2
If-Modified-Since: Sun, 18 Nov 2001 17:34:00 GMT
If-None-Match: "52eb4a-36-3bf7f108"
Cache-Control: max-age=0
```

| Referrer Objects |
|---|
| [HTTP] /index.php |

| Parameter Violations |
|---|
| No entries found |

### Max. Request Length

The maximum request length received from all the requests for this object type. (For example: the longest request among the 89 received for this file type.)

### Max. URI Length

The maximum URI length received from all the requests for this object type. (For example: the longest URI among the 89 received for this file type.)

### Max. Query String Length

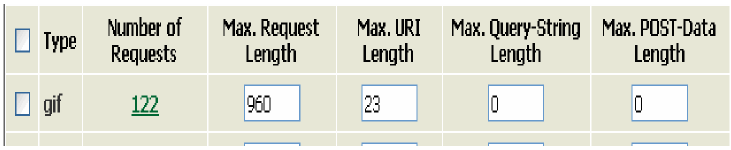
The maximum Query string length received from all the requests for this object type. (For example: the longest query string among the 89 received for this file type, note in this gif example the max query string length equals zero as this is not relevant to this object type.)

### Max. POST Data Length

The maximum Post data length received from all the requests for this object type. (For example: the longest Post data among the 89 received for this file type, again not relevant to this object type.)

## Actions available for Undefined Object Types

- **User input**: It is possible to manually change the value of some of the parameters. If the parameter is editable, it will appear as a user input box. Some examples:



| □ | Type | Number of Requests | Max. Request Length | Max. URI Length | Max. Query-String Length | Max. POST-Data Length |
|---|---|---|---|---|---|---|
| □ | gif | 122 | 960 | 23 | 0 | 0 |

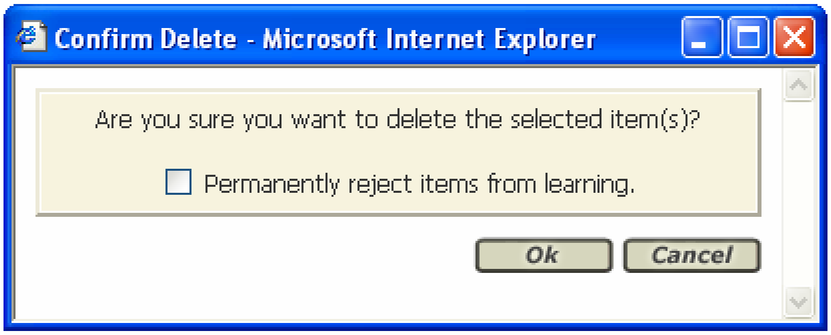
- **Accept**: Clicking the Accept button adds the changes to the policy. Accept means that you have decided that the request reflects a real-life situation that warrants a change in the policy. The undefined objects types will appear under the Configuration->Object Types.

  When you accept an Object type, the undefined objects window is automatically populated and displayed with all the objects belonging to all the requests for this object type. For example; if you accepted an HTML object type, all HTML requests' objects will now appear in the undefined objects window. See the next section for how to accept undefined objects.

  **Note**

  Requests with the accepted object types will still not be allowed by the TrafficShield security application until all the request's components have been "learned".

- **Clear**: Clicking Clear deletes the checked entries from this learning window without changing the policy. The following confirmation window is displayed.



Are you sure you want to delete the selected item(s)?

□ Permanently reject items from learning.

### Permanently reject items from learning

Check the "Permanently reject items from learning" checkbox to delete the request and also instruct the TrafficShield security application not to register again identical requests in the Learning tables. The deleted request goes to Forensics -> ignored items.

**Note**

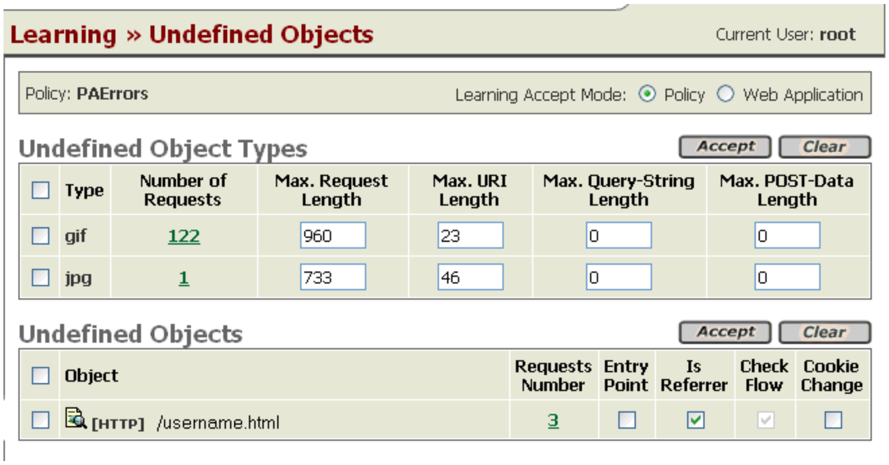
After transferring the requests to ignored items, all similar requests for all policies that belong to this Web application will ignore these requests. Warning: if you only want to apply this clear to this specific policy – don't check this checkbox. For example: if you checked this checkbox for HTML requests, all HTML requests (even rejected requests coming in for other policies will be ignored).

**Tip**

To change this decision after clicking Ok, you can go to Policy Management -> Forensics -> Ignored Items tab to unset the ignore decision. For more details, see the Forensics section in this document.

## Undefined Objects

The Undefined Objects window lists information about requests that referenced objects not be found in the Web application.



Learning » Undefined Objects

Current User: root

Policy: PAErrors

Learning Accept Mode: ● Policy ○ Web Application

Undefined Object Types

| □ | Type | Number of Requests | Max. Request Length | Max. URI Length | Max. Query-String Length | Max. POST-Data Length |
|---|---|---|---|---|---|---|
| □ | gif | 122 | 960 | 23 | 0 | 0 |
| □ | jpg | 1 | 733 | 46 | 0 | 0 |

Undefined Objects

| □ | Object | Requests Number | Entry Point | Is Referrer | Check Flow | Cookie Change |
|---|---|---|---|---|---|---|
| □ | [HTTP] /username.html | 3 | □ | ☑ | ☑ | □ |

### Select box column

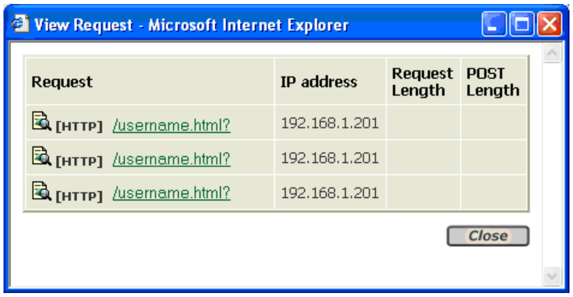
The first column contains checkboxes used to mark the relevant entry.

### Object

This column displays the name of the undefined object.

### Requests Number

This number indicates the number of requests that have been rejected for violating the identified object definitions. You can click this number to receive a detailed list.



| Request | IP address | Request Length | POST Length |
|---|---|---|---|
| [HTTP] /username.html? | 192.168.1.201 | | |
| [HTTP] /username.html? | 192.168.1.201 | | |
| [HTTP] /username.html? | 192.168.1.201 | | |

If you click on the link, a very detailed Full Request Information window will appear that contains all the technical details of all the violations related to the specific request.

### Entry Point

An entry point is a page through which a visitor enters the Web application, for example, by typing its URL in the browser's address box or by selecting its URL from a favorites list.

By checking this checkbox you indicate to the TrafficShield security application that this object should be considered a valid entry point.

### Is Referrer

Check this box if files of this type may refer to other files. For example, HTML pages containing a link or CGI files calling another file, are referrers. Pictures and sound files cannot be referrers because they do not link to any other pages.

### Check Flow

The Application Flow (path) is the defined access path leading from one object to another object. For example, a list of valid flows would be:

from abc.html to abc.gif, OK

from abc.html to def.html, OK

If your policy contains the above list, then any request that tries to access abc.gif from def.html would be considered illegal.

Check this checkbox to instruct the TrafficShield security application to verify that the object was accessed by a legally defined flow.

**Note**

Some of these checkboxes are checked as default and cannot be cleared by the user.

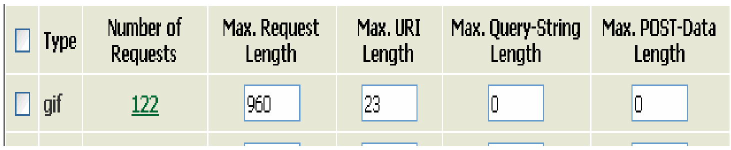
If you clear the checkbox, the object can be requested from any place in the Web application or even when the user is outside the scope of the application.

**Cookie Change**

Check this checkbox if the object modified one of the Web application cookies in order to prevent false positive alarms on cookie poisoning.

## Actions available for the Undefined Objects

- **User input**: It is possible to manually change the value of some of the parameters. If the parameter is editable, it will appear as a user input box. Some examples:



| □ | Type | Number of Requests | Max. Request Length | Max. URI Length | Max. Query-String Length | Max. POST-Data Length |
|---|---|---|---|---|---|---|
| □ | gif | 122 | 960 | 23 | 0 | 0 |

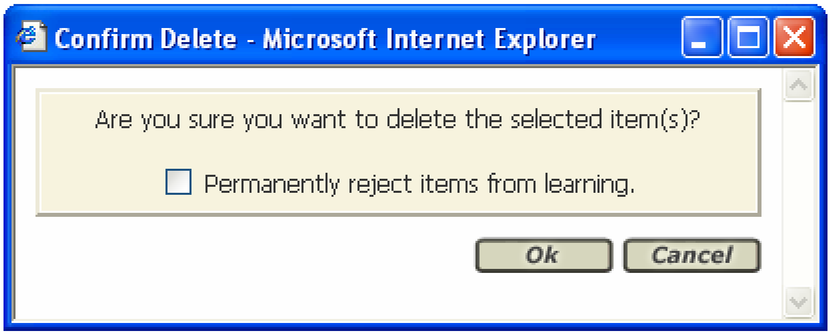
- **Accept**: Clicking the Accept button adds the changes to the policy. Accept means that you have decided that the request reflects a real-life situation that warrants a change in the policy.

  When you accept an Object, the undefined flow of the object is automatically added to the contents of the undefined flows window.

  **Note**

  Requests with the accepted object will still not be allowed by the TrafficShield security application until all the request's components have been "learned".

- **Clear**: Clicking Clear deletes the checked entries from this learning window without changing the policy. The following confirmation window is displayed.



Confirm Delete - Microsoft Internet Explorer

Are you sure you want to delete the selected item(s)?

□ Permanently reject items from learning.

**Permanently reject items from learning**

Check the "Permanently reject items from learning" checkbox to delete the request and also instruct the TrafficShield security application not to register again identical requests in the Learning tables. The deleted request goes to Forensics -> ignored items.

**Note**

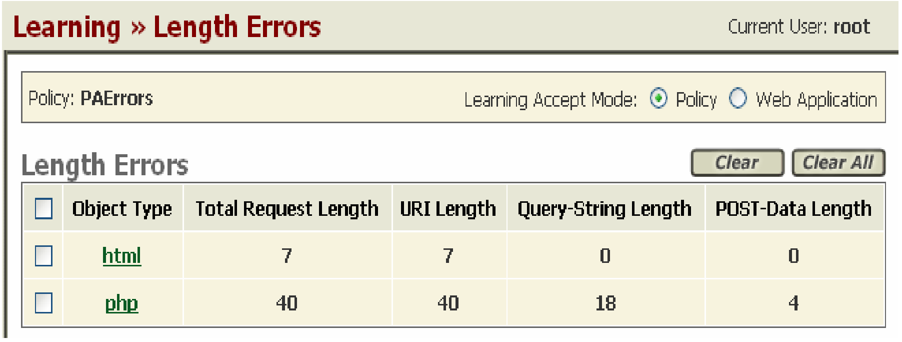
After transferring the requests to ignored items, all similar requests for all policies that belong to this Web application will ignore these requests. Warning: if you only want to apply this clear to this specific policy, don't check this checkbox.

**Tip**

To change this decision after clicking Ok, you can go to Policy Management -> Forensics -> Ignored Items tab to unset the ignore decision. For more details, see the Forensics section in this document.

# Length Errors

This tab lists the requests that exceeded a length setting.



Policy: PAErrors

Learning Accept Mode: ● Policy ○ Web Application

Length Errors

| □ | Object Type | Total Request Length | URI Length | Query-String Length | POST-Data Length |
|---|---|---|---|---|---|
| □ | html | 7 | 7 | 0 | 0 |
| □ | php | 40 | 40 | 18 | 4 |

**Select box column**
The first column contains checkboxes used to mark the relevant entry.

**Object Type**
Check the checkbox for the relevant Object (file) types that you want to clear. If you want to define and accept this object type length, you will need to click on the relevant Object type, and the Requests Lengths for "object" type window will be displayed. For more details, see the Accept Requests Lengths section in this chapter.

**Total Request Length**
The Total Request Length is the sum of the URI, Query string and POST data lengths in a specific request.

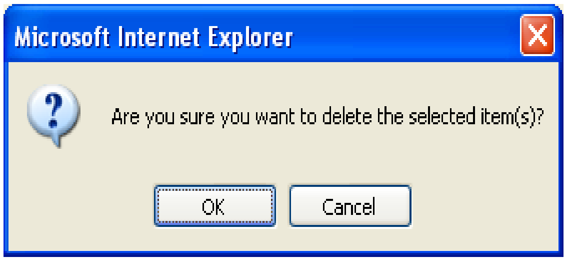
**Max. URI Length**
The maximum URI length received from all the requests for this object type.

**Max. Query String Length**
The maximum Query string length received from all the requests for this object type.

**Max. POST Data Length**
The maximum Post data length received from all the requests for this object type.

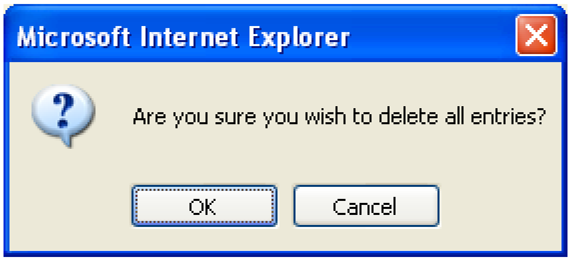
## Actions available for Length Errors

- **Clear**: Clicking Clear deletes the checked entries from this learning window without changing the policy. The following confirmation window is displayed.



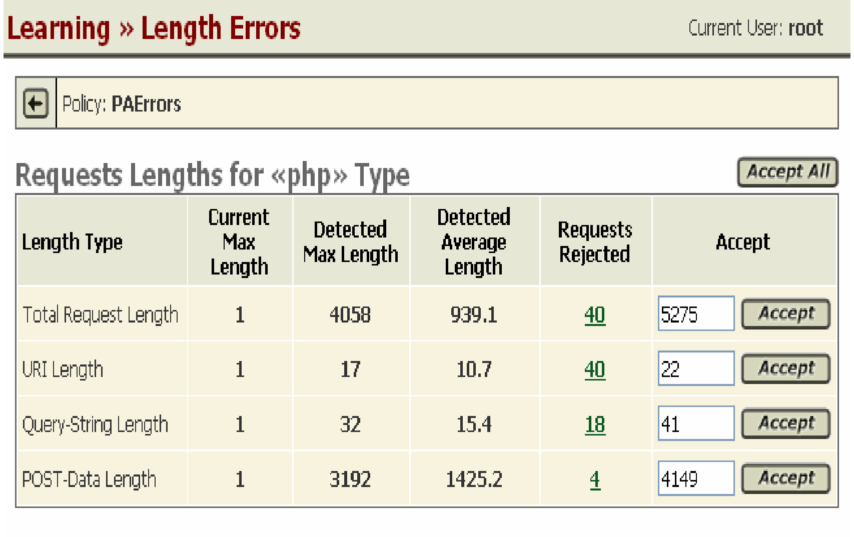
Are you sure you want to delete the selected item(s)?

- **Clear All**: Clicking Clear All will delete all entries from this learning window without changing the policy, regardless of whether they are checked or not. The following confirmation window is displayed.



Are you sure you wish to delete all entries?

## Accept Requests Lengths



Learning » Length Errors

Current User: root

Policy: PAErrors

Requests Lengths for «php» Type

| Length Type | Current Max Length | Detected Max Length | Detected Average Length | Requests Rejected | Accept |
|---|---|---|---|---|---|
| Total Request Length | 1 | 4058 | 939.1 | 40 | 5275 Accept |
| URI Length | 1 | 17 | 10.7 | 40 | 22 Accept |
| Query-String Length | 1 | 32 | 15.4 | 18 | 41 Accept |
| POST-Data Length | 1 | 3192 | 1425.2 | 4 | 4149 Accept |

**Length Type**

There are four length types. The Total Request Length is the sum of the other three types.

**Current Max Length**

The length set in the policy. For example, the Current Max Length (column) for URI Length (row) indicates the valid length defined in the policy for the URI section of the request.

**Detected Max Length**

This value indicates the highest length value that has been detected for a specific policy object.

**Detected Average Length**

This value indicates the average length value that has been detected for a specific length object. If the average length is very different from the Max length, this could indicate a problem that requires further investigation.

**Requests Rejected**

This is the number of requests that have been rejected for violating the length constraints.

Clicking the number opens the Full Request Information window that contains all the technical details of all the violations related to the longest request.

### Actions available for Accept Requests Lengths

- **Accept**: Choose the Accept button on the relevant length type row if you decide that the returned statistics reflect a real-life situation that warrants a change in the policy. You can also decide to manually define the new length in the user input field in the Accept column. The decision should be based on an in depth understanding of your Web application.
- **Accept All**: Choose the Accept All button if you decide that all the length types displayed reflect a real-life situation that warrants a change in the policy. You can also decide to manually define all new lengths in the user input fields in the Accept column. The decision should be based on an in depth understanding of your Web application.

*To return to the Lengths Error Tab:*

- *C*lick on the arrow button in the top left corner to return to the Lengths Error tab.

Or

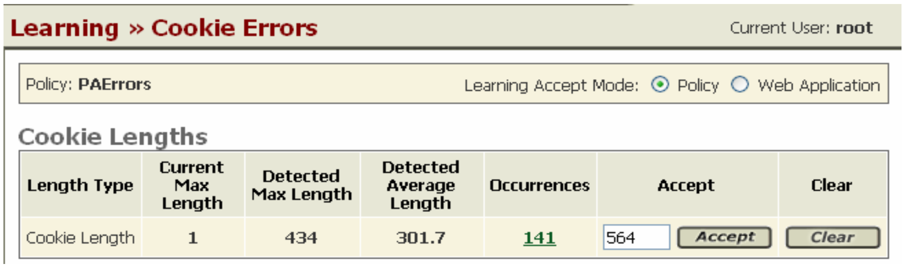
- Choose the Lengths Error Tab.

## Cookie Errors

This tab is divided into two parts; The Cookie lengths and Objects that modified domain cookies.

## Cookie Lengths

This tab provides information similar to the information found in the Length Errors tab, but applies to invalid cookie lengths. In this case too, you can update your policy by entering a different value in the Accept field.



Learning » Cookie Errors

Current User: root

Policy: PAErrors

Learning Accept Mode: ● Policy ○ Web Application

Cookie Lengths

| Length Type | Current Max Length | Detected Max Length | Detected Average Length | Occurrences | Accept | Clear |
|---|---|---|---|---|---|---|
| Cookie Length | 1 | 434 | 301.7 | 141 | 564 Accept | Clear |

**Length Type**

This is the length type name. At this time there is only one type.

**Current Max Length**

The valid length defined in the policy for the Cookie length.

**Detected Average Length**

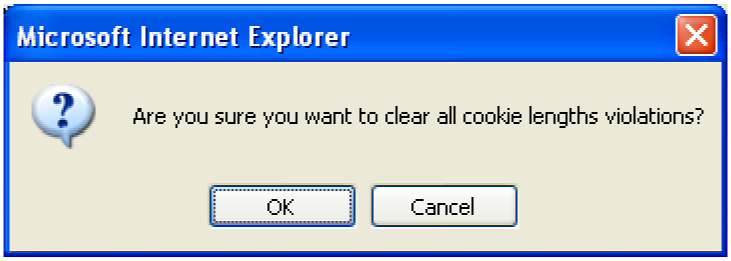
This value indicates the average cookie length that violated the cookie length constraint.

**Occurrences**

This number displays the number of requests that caused this violation.

## Actions available for Cookie Errors

- **User input**: It is possible to manually change the value of some of the parameters.
- **Accept**: Clicking the Accept button adds the changes to the policy. Accept means that you have decided that the request reflects a real-life situation that warrants a change in the policy.
- **Clear**: Clicking Clear deletes the entry from this learning window without changing the policy. The following confirmation window is displayed.

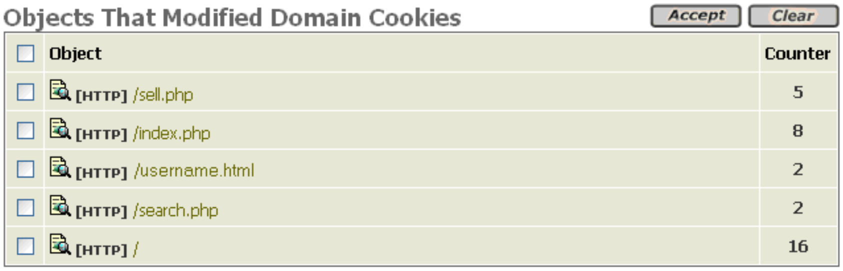


Microsoft Internet Explorer

Are you sure you want to clear all cookie lengths violations?

## Objects That Modified Domain Cookies

This window lists the objects that changed domain cookies. For each object, the Counter field specifies the number of requests where a modified domain cookie was detected and the object appeared as a referrer in the state cookie.



| □ | Object | Counter |
|---|---|---|
| □ | [HTTP] /sell.php | 5 |
| □ | [HTTP] /index.php | 8 |
| □ | [HTTP] /username.html | 2 |
| □ | [HTTP] /search.php | 2 |
| □ | [HTTP] / | 16 |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Object**

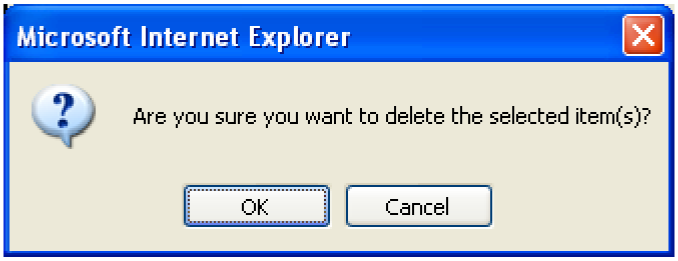
This is the name of the Object that modified the Domain Cookie

**Counter**

This is the number of times that the object modified the Domain Cookie.

### Actions available for Objects That Modified Domain Cookies

- **Accept**: Clicking the Accept button adds all the checked objects to the policy. Accept means that you have decided that the request reflects a real-life situation that warrants a change in the policy.
- **Clear**: Clicking Clear deletes the checked entries from this learning window without changing the policy. The following confirmation window is displayed.

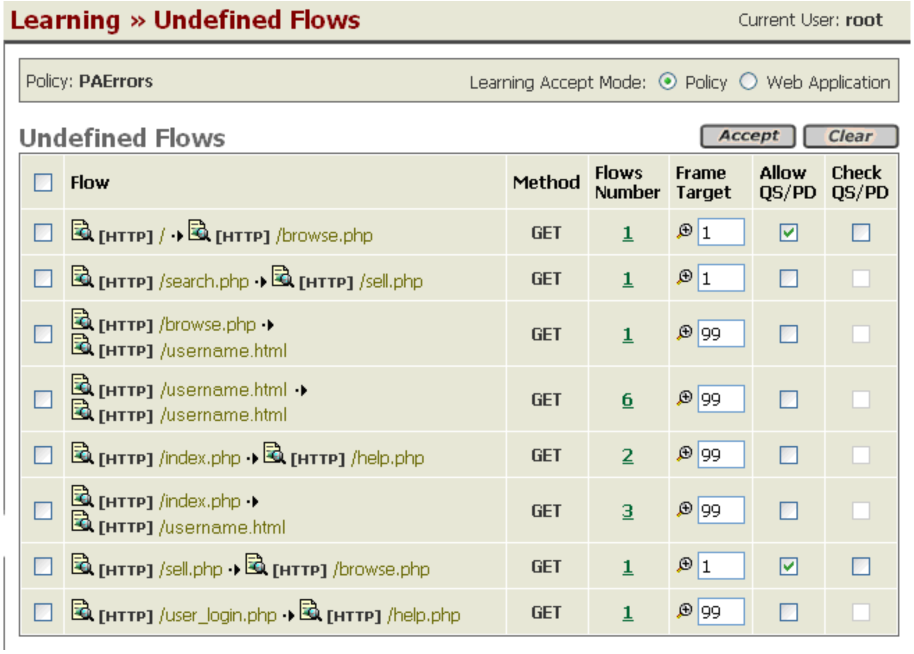


Microsoft Internet Explorer

Are you sure you want to delete the selected item(s)?

## Undefined Flows

The Undefined Flows tab lists the flows that were requested but were not found in the policy. In this case too, you can configure the query string and POST data settings of the undefined flow and include them in your policy by clicking the Accept button.



Learning » Undefined Flows    Current User: root

Policy: PAErrors    Learning Accept Mode: ● Policy ○ Web Application

Undefined Flows

| ☐ | Flow | Method | Flows Number | Frame Target | Allow QS/PD | Check QS/PD |
|---|---|---|---|---|---|---|
| ☐ | [HTTP] / → [HTTP] /browse.php | GET | 1 | 1 | ☑ | ☐ |
| ☐ | [HTTP] /search.php → [HTTP] /sell.php | GET | 1 | 1 | ☐ | ☐ |
| ☐ | [HTTP] /browse.php → [HTTP] /username.html | GET | 1 | 99 | ☐ | ☐ |
| ☐ | [HTTP] /username.html → [HTTP] /username.html | GET | 6 | 99 | ☐ | ☐ |
| ☐ | [HTTP] /index.php → [HTTP] /help.php | GET | 2 | 99 | ☐ | ☐ |
| ☐ | [HTTP] /index.php → [HTTP] /username.html | GET | 3 | 99 | ☐ | ☐ |
| ☐ | [HTTP] /sell.php → [HTTP] /browse.php | GET | 1 | 1 | ☑ | ☐ |
| ☐ | [HTTP] /user_login.php → [HTTP] /help.php | GET | 1 | 99 | ☐ | ☐ |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Flow**

This is the name of the Application Flow (path) which defines the access path leading from one object to another object.

**Method**

This is the HTTP method used in the Request. For more details refer to RFC-2610 (HTTP).

**Flows Number**

This field displays the number of requests that generated this undefined flow.

**Frame Target**

This is the index of the HTML frame targeted by the flow. It is not recommend that you change this value unless you know that you want to specifically load this object into a specific frame.

**Note**

The value 99 is a default frame index which means that the target object is loaded into the same frame as where the referrer object is presented.

**Allow QS/PD**

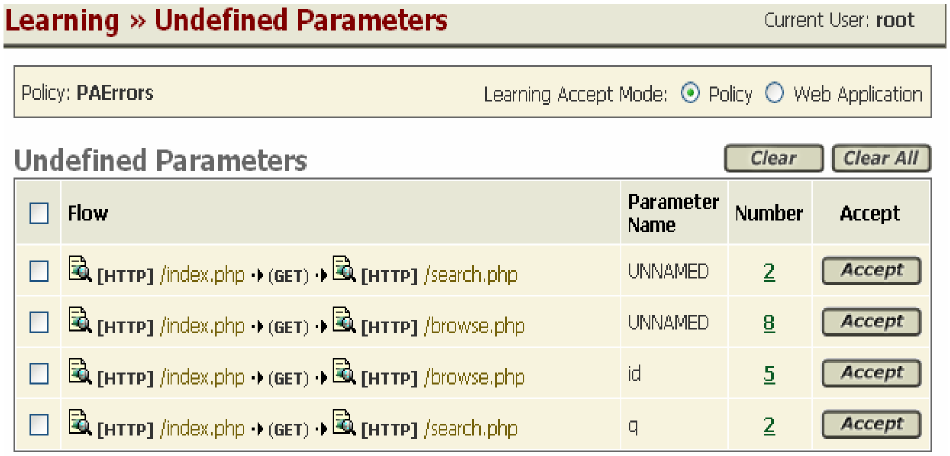
Check this box if a request that accesses the selected object via this specific flow may also carry a query string or POST method.

**Check QS/PD**

Check this box to instruct the TrafficShield security application to perform validity checks on the query string or POST data if allowed in the previous step.

## Undefined Parameters

The Undefined Parameters window lists parameters that can appear in the request but are not defined for a specific flow.



Learning » Undefined Parameters

Current User: **root**

Policy: **PAErrors**

Learning Accept Mode: ● Policy ○ Web Application

Undefined Parameters

| □ | Flow | Parameter Name | Number | Accept |
|---|---|---|---|---|
| □ | [HTTP] /index.php → (GET) → [HTTP] /search.php | UNNAMED | 2 | Accept |
| □ | [HTTP] /index.php → (GET) → [HTTP] /browse.php | UNNAMED | 8 | Accept |
| □ | [HTTP] /index.php → (GET) → [HTTP] /browse.php | id | 5 | Accept |
| □ | [HTTP] /index.php → (GET) → [HTTP] /search.php | q | 2 | Accept |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Flow**

This is the name of the Application Flow (path) which defines the access path leading from one object to another object.

**Parameter Name**

This is the name of the undefined parameter.

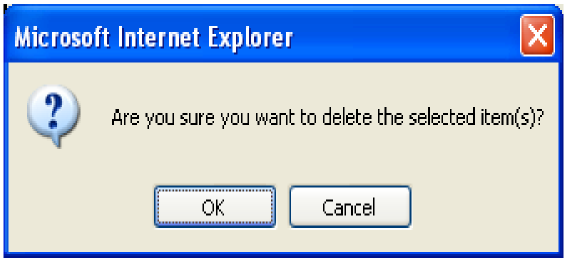
**Number**

This number displays the number of requests that caused this violation.

## Actions available for Undefined Parameters

- **Accept**: Choose the Accept button on the relevant parameter row, if you decide that the returned statistics reflect a real-life situation that warrants a change in the policy.

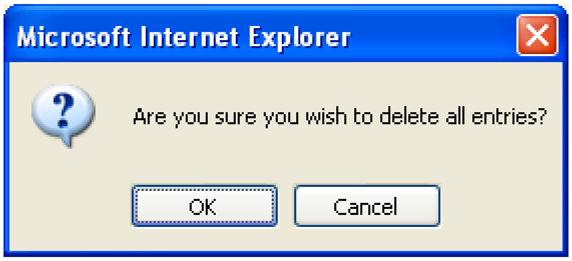
- **Clear**: Clicking Clear deletes the checked entries from this learning window without changing the policy. The following confirmation window is displayed.



Microsoft Internet Explorer

Are you sure you want to delete the selected item(s)?

- **Clear All**: Clicking Clear All will delete all entries from this learning window without changing the policy, regardless of whether they are checked or not. The following confirmation window is displayed.



Microsoft Internet Explorer

Are you sure you wish to delete all entries?

# Value Errors

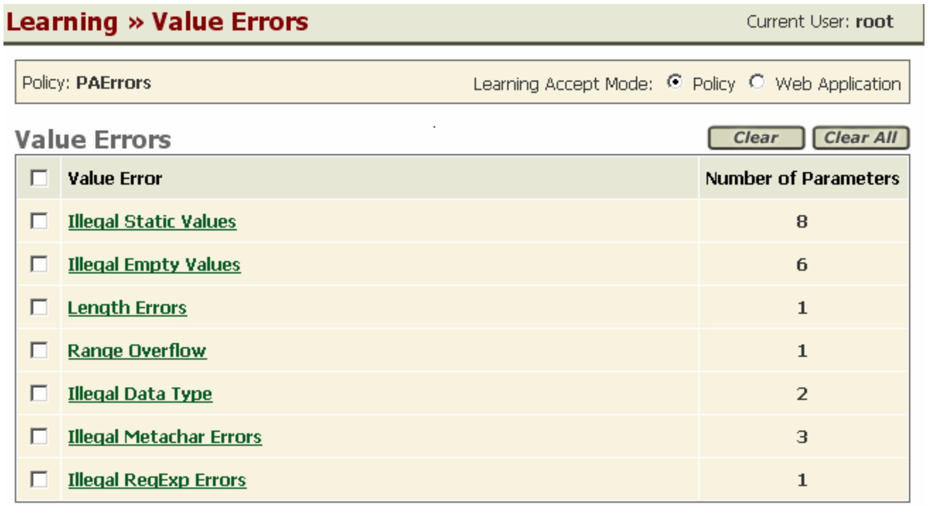
The Value Errors screen lists the errors that can occur to the request parameters' values. This window provides statistical information regarding the types of parameter value problems that have been detected.

## Actions available for Value Errors

- **Accept**: if you decide that the returned statistics reflect a real-life situation that warrants a change in the policy, you should choose Accept and confirm it if required.
- **Clear**: Click Clear to clear the specific entry/entries from this learning window without changing the policy.
- **Clear All**: Click Clear All to delete all entries from this learning window without changing the policy, regardless of whether they are checked or not. You will be asked to confirm this.

**Note**

The values displayed in all screenshots are only examples.



Learning » Value Errors

Current User: root

Policy: PAErrors

Learning Accept Mode: ● Policy ○ Web Application

Value Errors

| □ | Value Error | Number of Parameters |
|---|---|---|
| □ | Illegal Static Values | 8 |
| □ | Illegal Empty Values | 6 |
| □ | Length Errors | 1 |
| □ | Range Overflow | 1 |
| □ | Illegal Data Type | 2 |
| □ | Illegal Metachar Errors | 3 |
| □ | Illegal RegExp Errors | 1 |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Value Error**

This is the Value error name.

**Number of Parameters**

This is the number of parameters that have violated the valid value definitions.

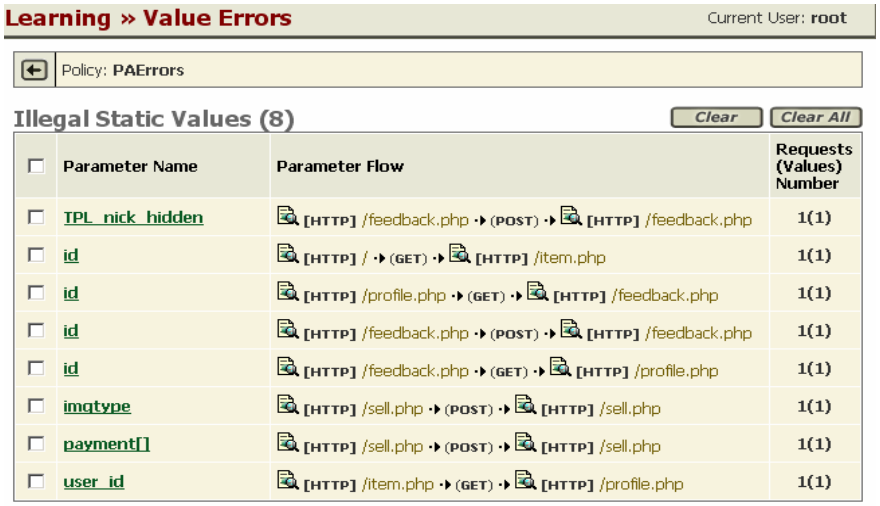
**Note**

Each error in the screen shot above has related parameters that have violated the valid value definition. This automatically creates a link to the violation list window. If there are no violations (Number of Parameters equals zero) of this error type, the link is not created.

Each Value Error is explained below:

## Illegal Static Values

This screen shows static parameters that carried a value not included in the value list defined in the policy.



Illegal Static Values (8)

| □ | Parameter Name | Parameter Flow | Requests (Values) Number |
|---|---|---|---|
| □ | TPL_nick_hidden | [HTTP] /feedback.php → (POST) → [HTTP] /feedback.php | 1(1) |
| □ | id | [HTTP] / → (GET) → [HTTP] /item.php | 1(1) |
| □ | id | [HTTP] /profile.php → (GET) → [HTTP] /feedback.php | 1(1) |
| □ | id | [HTTP] /feedback.php → (POST) → [HTTP] /feedback.php | 1(1) |
| □ | id | [HTTP] /feedback.php → (GET) → [HTTP] /profile.php | 1(1) |
| □ | imgtype | [HTTP] /sell.php → (POST) → [HTTP] /sell.php | 1(1) |
| □ | payment[] | [HTTP] /sell.php → (POST) → [HTTP] /sell.php | 1(1) |
| □ | user_id | [HTTP] /item.php → (GET) → [HTTP] /profile.php | 1(1) |

**Select box column**

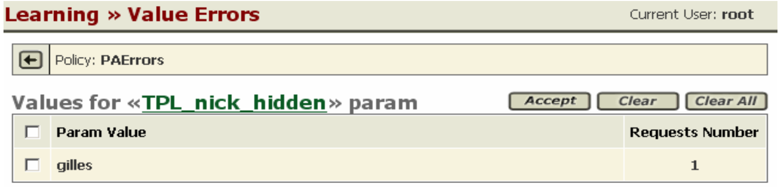
The first column contains checkboxes used to mark the relevant entry.

**Parameter Name**

Lists the parameters where Value Error was found.

**Note**

Each parameter name links to a more detailed window that displays the variations of parameter values that caused this value error violation.



Policy: PAErrors

Values for «TPL_nick_hidden» param

| □ | Param Value | Requests Number |
|---|---|---|
| □ | gilles | 1 |

**Param Value**

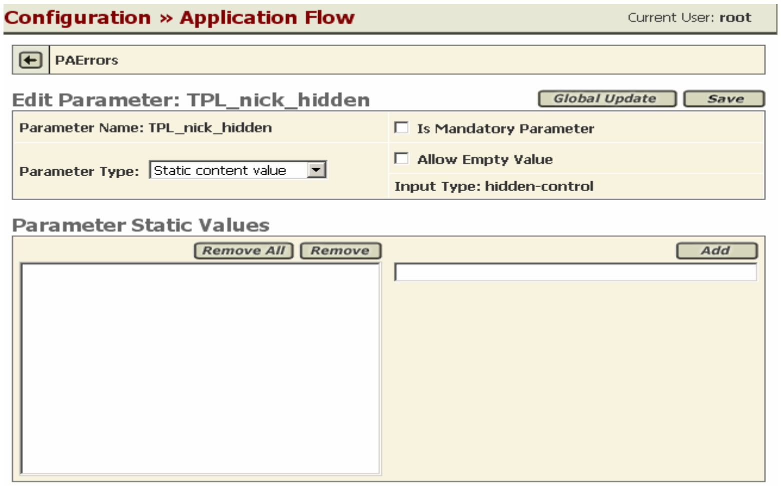
This column displays the parameter value that caused this value error violation.

**Requests Number**

This column displays the number of requests that caused this violation.

*To edit the parameter definitions:*

Click the parameter name link. The Edit Parameter screen will be displayed. For more details on how to edit the parameter fields, please refer to the Policy Component Editing section later in this chapter.



PAErrors

Edit Parameter: TPL_nick_hidden

Parameter Name: TPL_nick_hidden

□ Is Mandatory Parameter

Parameter Type: Static content value

□ Allow Empty Value

Input Type: hidden-control

Parameter Static Values

**Parameter Flow**

This column lists the flows where the parameter value error was found.

**Requests (Values) Number**

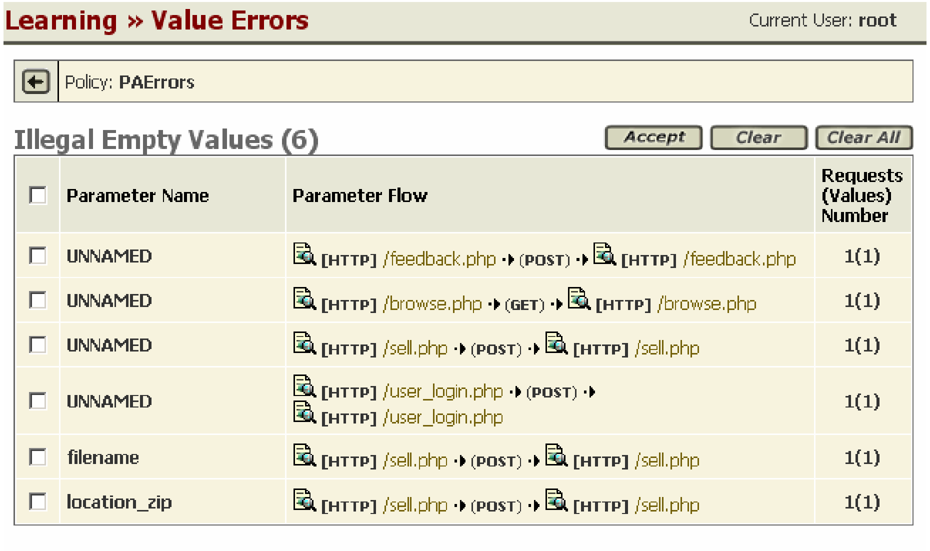
The external number represents the total number of requests that were received with this value error. The internal number represents the different variations of the value error received.

## Illegal Empty Values

This window displays the list of parameters that violated the not null value definition. (The field was empty when it should have contained a value.)

**Note**

The decision whether a specific parameter can be left empty or not is dependent on the web application.



Learning » Value Errors Current User: root

Policy: PAErrors

Illegal Empty Values (6)

| □ | Parameter Name | Parameter Flow | Requests (Values) Number |
|---|---|---|---|
| □ | UNNAMED | [HTTP] /feedback.php ▸ (POST) ▸ [HTTP] /feedback.php | 1(1) |
| □ | UNNAMED | [HTTP] /browse.php ▸ (GET) ▸ [HTTP] /browse.php | 1(1) |
| □ | UNNAMED | [HTTP] /sell.php ▸ (POST) ▸ [HTTP] /sell.php | 1(1) |
| □ | UNNAMED | [HTTP] /user_login.php ▸ (POST) ▸ [HTTP] /user_login.php | 1(1) |
| □ | filename | [HTTP] /sell.php ▸ (POST) ▸ [HTTP] /sell.php | 1(1) |
| □ | location_zip | [HTTP] /sell.php ▸ (POST) ▸ [HTTP] /sell.php | 1(1) |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Parameter Name**

Value Error was found in these parameters.

**Parameter Flow**

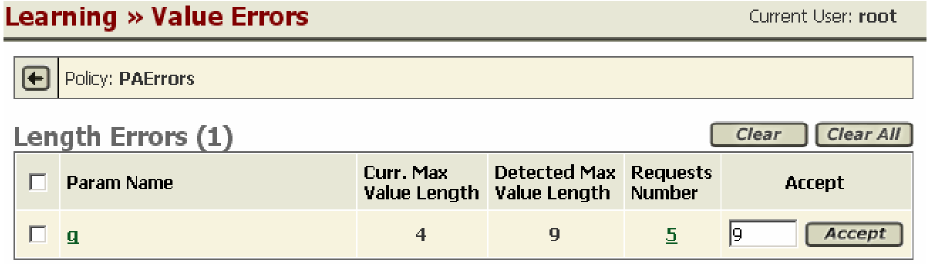
This column lists the flows where the parameter value error was found.

**Requests (Values) Number**

The external number represents the total number of requests that were received with this value error. The internal number represents the different variations of the value error received.

## Length Errors

String parameters whose length exceeds the length defined in the policy.



Learning » Value Errors

Current User: root

Policy: PAErrors

Length Errors (1)

| □ | Param Name | Curr. Max Value Length | Detected Max Value Length | Requests Number | Accept |
|---|---|---|---|---|---|
| □ | q | 4 | 9 | 5 | 9 Accept |

**Select box column**

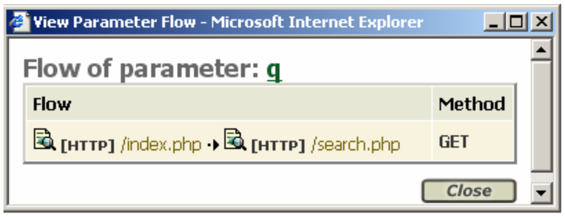
The first column contains checkboxes used to mark the relevant entry.

**Parameter Name**

Value Error was found in these parameters.

**Note**

Each parameter name links to a more detailed window that displays the parameter flow where the violation occurred.



Flow of parameter: q

| Flow | Method |
|---|---|
| [HTTP] /index.php → [HTTP] /search.php | GET |

**Current Max Value Length**

The length set in the policy. This length indicates the valid length defined in the policy for the parameter value of the request.

**Detected Max Length**

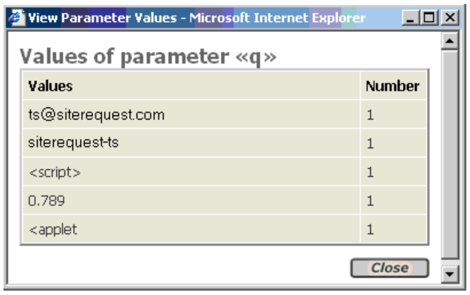
This value indicates the highest length value that has been detected for a specific parameter value.

**Requests Number**

The number represents the total number of requests that were received with this value error.

**Note**

Clicking the number opens the View Parameter Values window that contains a list of all the variations of values received that caused this violation.

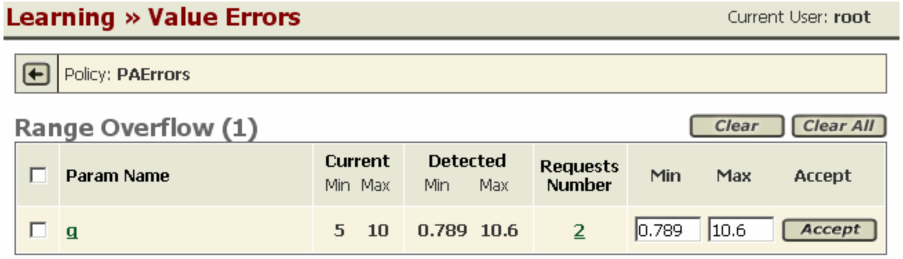


Values of parameter «q»

| Values | Number |
|---|---|
| ts@siterequest.com | 1 |
| siterequest-ts | 1 |
| <script> | 1 |
| 0.789 | 1 |
| <applet | 1 |

## Range Overflow

This is the numeric value of the parameters whose value does not fall within the Min-Max (minimum to maximum) range defined in the policy.



Range Overflow (1)

| □ | Param Name | Current Min | Current Max | Detected Min | Detected Max | Requests Number | Min | Max | Accept |
|---|---|---|---|---|---|---|---|---|---|
| □ | q | 5 | 10 | 0.789 | 10.6 | 2 | 0.789 | 10.6 | Accept |

**Select box column**

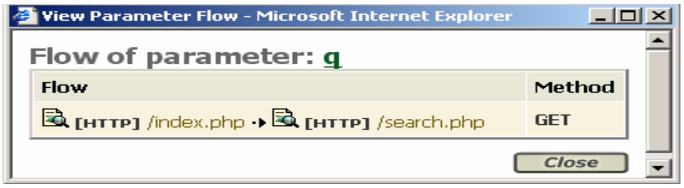
The first column contains checkboxes used to mark the relevant entry.

**Parameter Name**

Value Error was found in these parameters.

**Note**

Each parameter name links to a detail window that displays the parameter flow where the violation occurred.



Flow of parameter: q

| Flow | Method |
|---|---|
| [HTTP] /index.php → [HTTP] /search.php | GET |

**Current Min/Max**

This field represents the Min-Max range defined in the policy.

**Detected Min/Max**

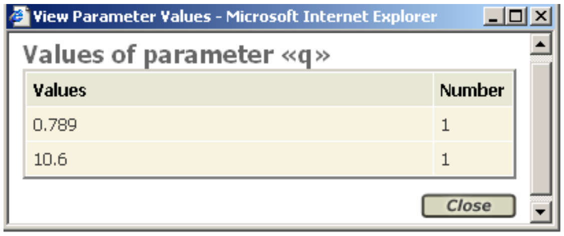
This field represents the Min-Max values received in the parameter that caused the violation.

**Requests Number**

The number represents the total number of requests that were received with these value errors.

**Note**

Clicking the number opens the View Parameter Values window that contains a list of all the variations of values received that caused this violation.



Values of parameter «q»

| Values | Number |
|---|---|
| 0.789 | 1 |
| 10.6 | 1 |

**Min**

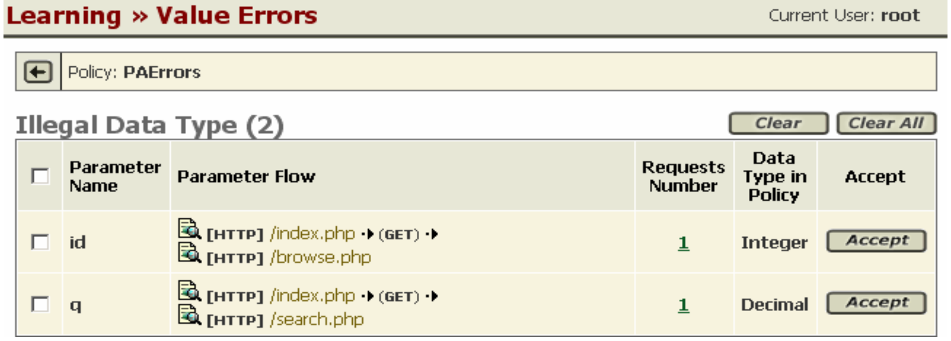
This is the minimum value received from all the request parameters with this violation type. It is possible to manually change the value of this field.

**Max**

This is the maximum value received from all the request parameters with this violation type. It is possible to manually change the value of this field.

## Illegal Data Type

This screen shows parameters whose data type is different from the data type defined for them in the policy.



Learning » Value Errors

Current User: root

Policy: PAErrors

Illegal Data Type (2)

| □ | Parameter Name | Parameter Flow | Requests Number | Data Type in Policy | Accept |
|---|---|---|---|---|---|
| □ | id | [HTTP] /index.php → (GET) →<br>[HTTP] /browse.php | 1 | Integer | Accept |
| □ | q | [HTTP] /index.php → (GET) →<br>[HTTP] /search.php | 1 | Decimal | Accept |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Parameter Name**

Value Error was found in these parameters.

**Parameter Flow**

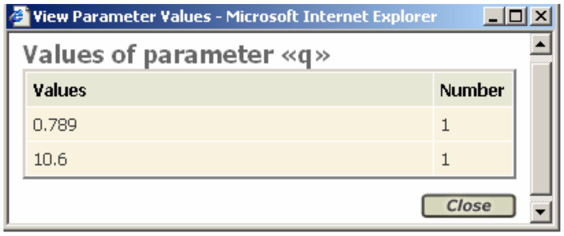
This is the flow where the parameter value error occurred.

**Requests Number**

The number represents the total number of requests that were received with these value errors.

**Note**

Clicking the number opens the View Parameter Values window that contains a list of all the variations of values received that caused this violation.



View Parameter Values - Microsoft Internet Explorer

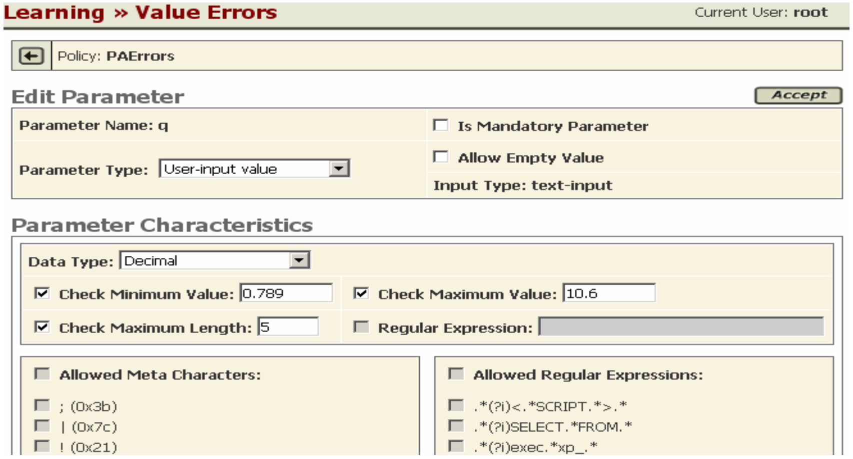
Values of parameter «q»

| Values | Number |
|---|---|
| 0.789 | 1 |
| 10.6 | 1 |

**Data Type in Policy**

This field displays the data type defined in the policy that was detected by the value error.

*Accept:* When you choose Accept, the Edit Parameter screen displays. For more details on how to edit the parameter fields, please refer to the Policy Components Editing section in this document.



Learning » Value Errors                                   Current User: root

Policy: PAErrors

Edit Parameter

Parameter Name: q
□ Is Mandatory Parameter
Parameter Type: User-input value
□ Allow Empty Value
Input Type: text-input

Parameter Characteristics

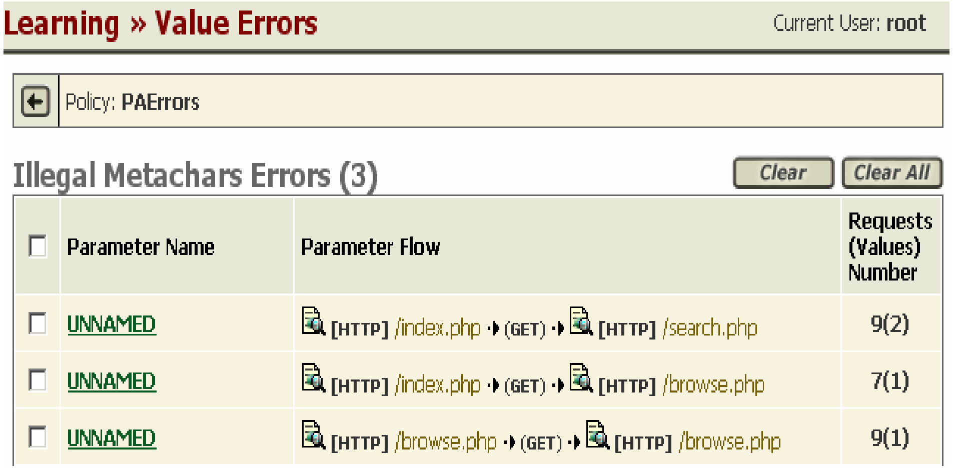
Data Type: Decimal
☑ Check Minimum Value: 0.789    ☑ Check Maximum Value: 10.6
☑ Check Maximum Length: 5    □ Regular Expression:

□ Allowed Meta Characters:
□ ; (0x3b)
□ | (0x7c)
□ ! (0x21)

□ Allowed Regular Expressions:
□ .*(?i)<.*SCRIPT.*>.*
□ .*(?i)SELECT.*FROM.*
□ .*(?i)exec.*xp_.*

## Illegal Metachars Errors

This screen lists parameters whose values contain meta characters that have been excluded from the policy.



Learning » Value Errors                                   Current User: root

Policy: PAErrors

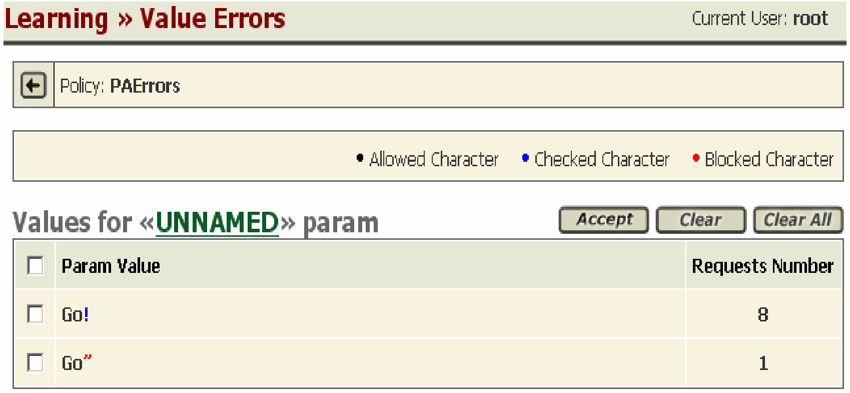
Illegal Metachars Errors (3)

| □ | Parameter Name | Parameter Flow | Requests (Values) Number |
|---|---|---|---|
| □ | UNNAMED | [HTTP] /index.php → (GET) → [HTTP] /search.php | 9(2) |
| □ | UNNAMED | [HTTP] /index.php → (GET) → [HTTP] /browse.php | 7(1) |
| □ | UNNAMED | [HTTP] /browse.php → (GET) → [HTTP] /browse.php | 9(1) |

**Parameter Name**
Value Error was found in these parameters.

**Note**

Each parameter name links to a more detailed window that displays the parameter flow where the violation occurred.



Learning » Value Errors

Current User: root

Policy: PAErrors

• Allowed Character • Checked Character • Blocked Character

Values for «UNNAMED» param

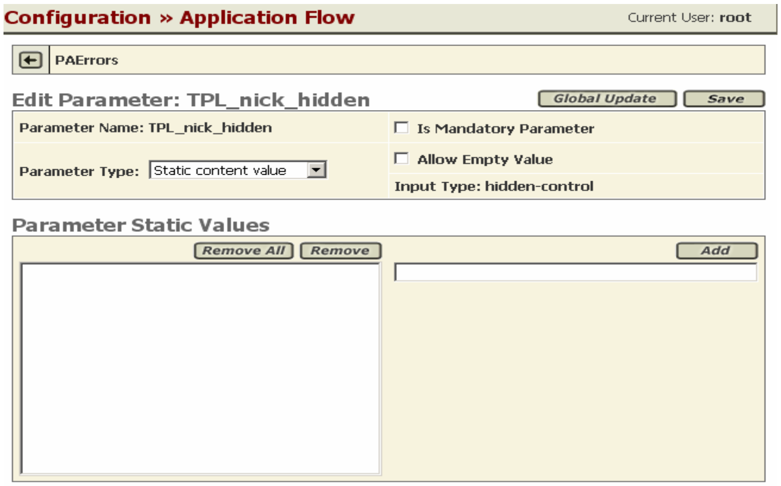
| □ | Param Value | Requests Number |
|---|---|---|
| □ | Go! | 8 |
| □ | Go" | 1 |

**Param Value**
This column lists the parameters' values received.

**Requests Number**
The number represents the total number of requests that were received with these value errors.

*To edit the parameter definitions:*

Click the parameter name link. The Edit Parameter screen is displayed. For more details on how to edit the parameter fields, please refer to the Policy Component Editing section in this document.



Configuration » Application Flow — Current User: root

PAErrors

Edit Parameter: TPL_nick_hidden

| | |
|---|---|
| Parameter Name: TPL_nick_hidden | □ Is Mandatory Parameter |
| Parameter Type: Static content value | □ Allow Empty Value |
| | Input Type: hidden-control |

Parameter Static Values

**Parameter Flow**

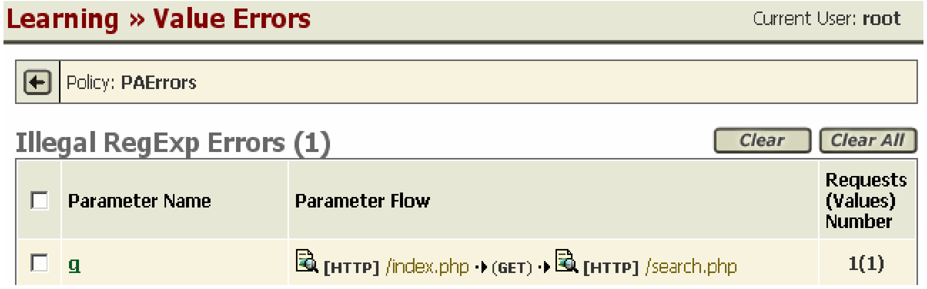
This is the flow where the parameter value error occurred.

**Requests (Values) Number**

The external number represents the total number of requests that were received with this value error. The internal number represents the different variations of the value error received.

## Illegal RegExp Errors

This is the parameter that contains a regular expression value that is not defined as an allowed regular expression for this parameter.



Learning » Value Errors — Current User: root

Policy: PAErrors

Illegal RegExp Errors (1)

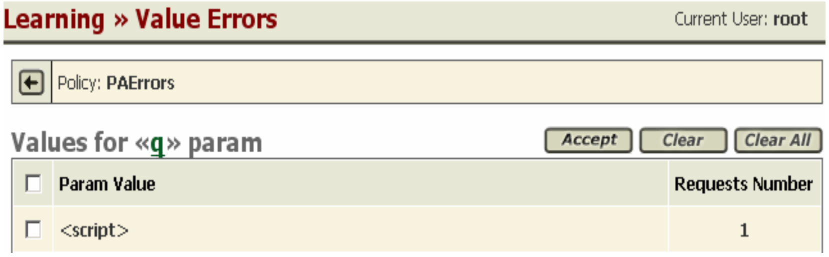
| □ | Parameter Name | Parameter Flow | Requests (Values) Number |
|---|---|---|---|
| □ | q | [HTTP] /index.php → (GET) → [HTTP] /search.php | 1(1) |

**Parameter Name**

Value Error was found in these parameters.

**Note**

Each parameter name links to a more detailed window that displays the variations of parameter values that caused this value error violation.



Learning » Value Errors

Current User: root

Policy: PAErrors

Values for «q» param

| □ | Param Value | Requests Number |
|---|---|---|
| □ | <script> | 1 |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Param Value**

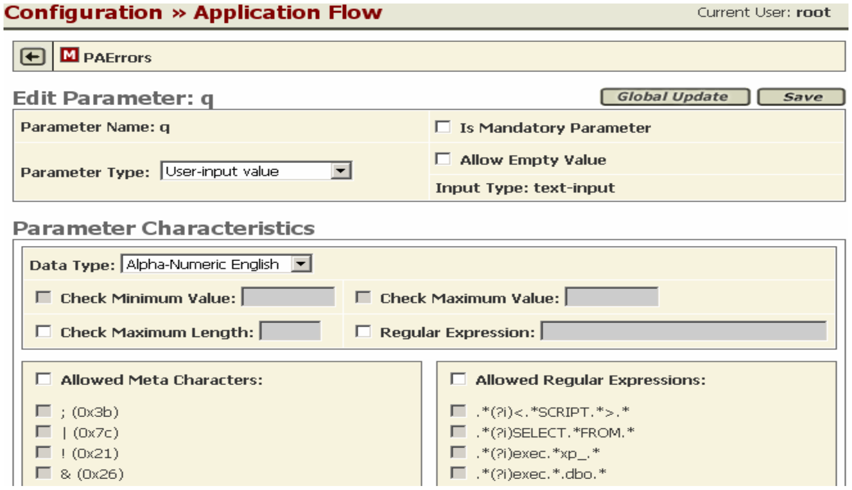
This column lists the parameters' values received.

**Requests Number**

The number represents the total number of requests that were received with these value errors.

*To edit the parameter definitions:*

Click the parameter name link. The Edit Parameter screen displays. For more details on how to edit the parameter fields, please refer to the Policy Component Editing section in this document.



Edit Parameter: q

Parameter Name: q

□ Is Mandatory Parameter

Parameter Type: User-input value

□ Allow Empty Value

Input Type: text-input

Parameter Characteristics

Data Type: Alpha-Numeric English

□ Check Minimum Value:

□ Check Maximum Value:

□ Check Maximum Length:

□ Regular Expression:

□ Allowed Meta Characters:

- □ ; (0x3b)
- □ | (0x7c)
- □ ! (0x21)
- □ & (0x26)

□ Allowed Regular Expressions:

- □ .*(?i)<.*SCRIPT.*>.*
- □ .*(?i)SELECT.*FROM.*
- □ .*(?i)exec.*xp_.*
- □ .*(?i)exec.*.dbo.*

**Parameter Flow**

This is the flow where the parameter value error occurred.

**Requests (Values) Number**

The external number represents the total number of requests that were received with this value error. The internal number represents the different variations of the value error received.

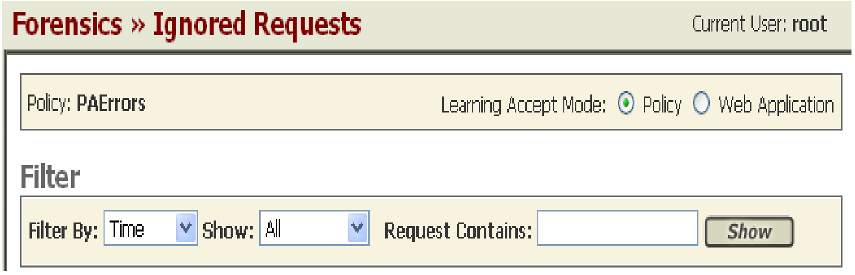
# Forensics

This section explains how the user can review all the requests that caused at least one violation error. Each request is mapped to the learning tables, and the user can locate the full content of the specific request in order to do further investigation and to have a better understanding of the problem.

All requests that violate the policy settings always go to the Illegal Requests table in the Forensics section. The other Forensic tables store deleted or legalized requests.

You can select multiple Forensic entries using the Forensic filters tool located at the top of all the Forensic windows.

## Ignored Requests



Forensics » Ignored Requests

Current User: root

Policy: PAErrors

Learning Accept Mode: ● Policy ○ Web Application

Filter

Filter By: Time Show: All Request Contains:

**Filter By:**

The options are: Time (default), IP and Violation

**Show:**

This field dynamically changes and provides different sub-filtering capabilities according to the option chosen in the Filter By field.

For example: for Time, the user can choose a specific time range. Choosing IP displays a list of source IPs. Choosing Violation provides a long list of possible violation filters that fits the list in the Policy Properties section.

**Request Contains:**

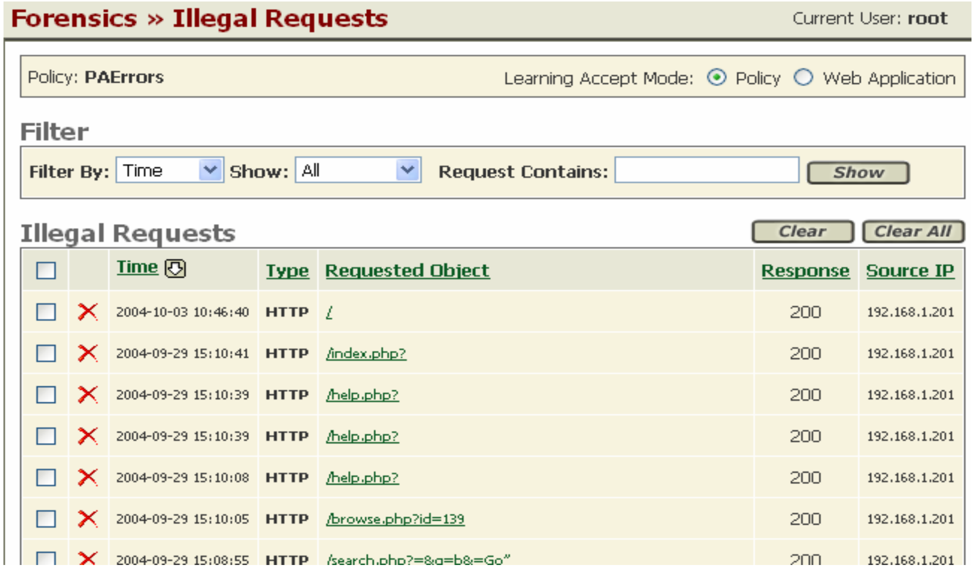
This field is used to find requests that contain a specified substring.

## Illegal Requests

### Handling Illegal Requests

You can view requests that contradict the policy in the Illegal Requests window. In addition, these requests are automatically categorized according to their content and registered in the appropriate Learning tables as well.

For example, a request for an illegal flow is registered in Forensics – Illegal Requests and also in Learning – Undefined Flows.



**Forensics » Illegal Requests** Current User: **root**

Policy: **PAErrors** Learning Accept Mode: ● Policy ○ Web Application

**Filter**

**Filter By:** Time **Show:** All **Request Contains:**

**Illegal Requests**

| □ | | Time | Type | Requested Object | Response | Source IP |
|---|---|---|---|---|---|---|
| □ | ✗ | 2004-10-03 10:46:40 | HTTP | / | 200 | 192.168.1.201 |
| □ | ✗ | 2004-09-29 15:10:41 | HTTP | /index.php? | 200 | 192.168.1.201 |
| □ | ✗ | 2004-09-29 15:10:39 | HTTP | /help.php? | 200 | 192.168.1.201 |
| □ | ✗ | 2004-09-29 15:10:39 | HTTP | /help.php? | 200 | 192.168.1.201 |
| □ | ✗ | 2004-09-29 15:10:08 | HTTP | /help.php? | 200 | 192.168.1.201 |
| □ | ✗ | 2004-09-29 15:10:05 | HTTP | /browse.php?id=139 | 200 | 192.168.1.201 |
| □ | ✗ | 2004-09-29 15:08:55 | HTTP | /search.php?=&q=b&=Go" | 200 | 192.168.1.201 |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Blocked column**

The second column may contain a red **X** which indicates that this request was blocked.

**Time**

This shows the date and time of the request.

**Type**

This shows the protocol of the request (HTTP/HTTPS).

**Requested Object**

This field displays the requested URI.

**Note**

Click a specific object to view the full contents of the request, and the View Full Request Information window is displayed.

**Response**

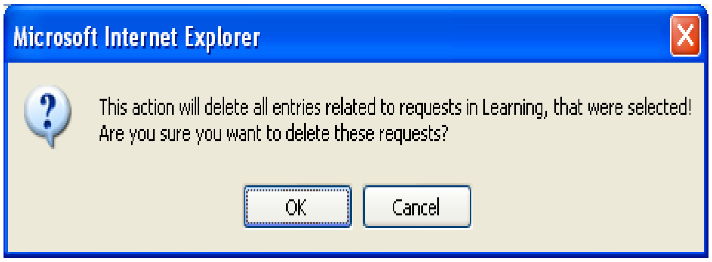
This field is the server HTTP response status.

**Source IP**

This is the IP address of the client machine that issued the request.

### Actions available for Illegal Requests

- **Clear**: Clicking Clear deletes the checked entries from this window without changing the policy. The following confirmation window is displayed.



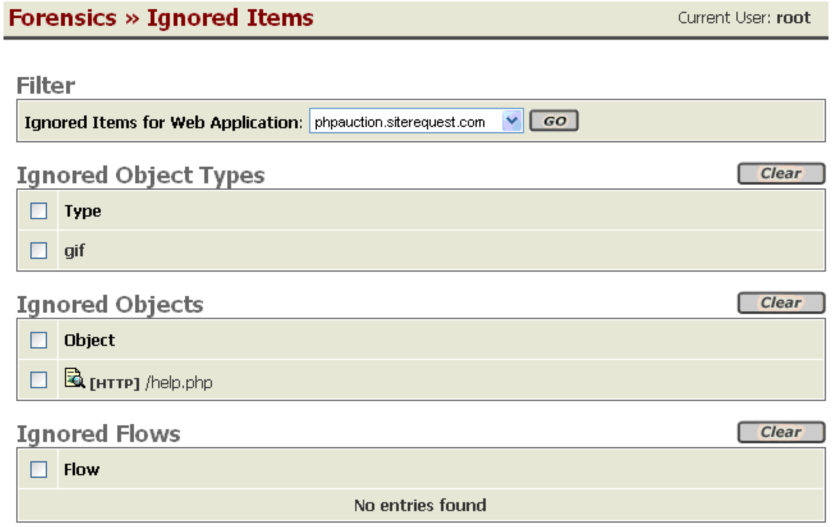
This action will delete all entries related to requests in Learning, that were selected!
Are you sure you want to delete these requests?

- **Clear All**: Clicking Clear All deletes all entries from this learning window without changing the policy, regardless of whether they are checked or not. You will be asked to confirm this.

## Ignored Items

This section explains the origin of the items listed in the Ignored Items window.

While using the Learning capabilities to fine tune the policy object types, objects and flows may be either accepted or cleared. When a user chooses to clear any of the items in the above list, the user is asked whether he would like to “permanently reject the item from learning.” This instructs the TrafficShield security application not to register duplicate identical requests in the Learning tables. The deleted request goes to the Forensics -> Ignored Items screen.



Forensics » Ignored Items

Current User: root

Filter

Ignored Items for Web Application: phpauction.siterequest.com GO

Ignored Object Types Clear

| | |
|---|---|
| □ | Type |
| □ | gif |

Ignored Objects Clear

| | |
|---|---|
| □ | Object |
| □ | [HTTP] /help.php |

Ignored Flows Clear

| | |
|---|---|
| □ | Flow |
| | No entries found |

All new requests containing an Object Type, an Object, or a Flow that match an entry in this window are ignored and do not appear in the Illegal Requests window.

The new ignored request is displayed in the Ignored Request window.

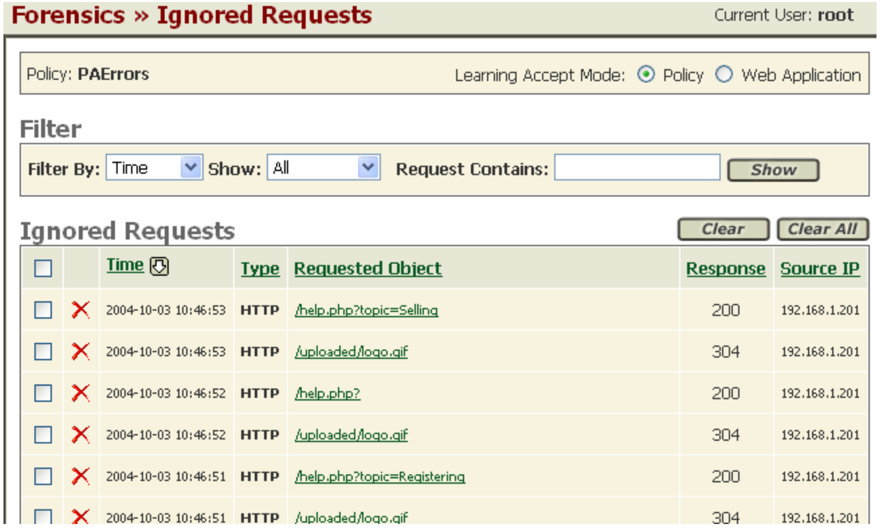
### Actions available for Length Errors

To change the permanent ignore decision, check the checkbox next to the relevant item, and click the relevant Clear button.

The next time a new request causes a violation it will not be ignored, and will appear in the corresponding Learning windows, and the full request contents will be viewable in the Illegal Requests window.

## Ignored Requests

This section deals with requests that were actually illegal but could not be mapped into the illegal request tables since the Object Type, Object, or Flow match one of the Ignored Items entries.



Forensics » Ignored Requests — Current User: **root**

Policy: **PAErrors** — Learning Accept Mode: ● Policy ○ Web Application

Filter

Filter By: Time Show: All Request Contains: [ ] Show

Ignored Requests — Clear Clear All

| □ | | Time | Type | Requested Object | Response | Source IP |
|---|---|---|---|---|---|---|
| □ | ✕ | 2004-10-03 10:46:53 | HTTP | /help.php?topic=Selling | 200 | 192.168.1.201 |
| □ | ✕ | 2004-10-03 10:46:53 | HTTP | /uploaded/logo.gif | 304 | 192.168.1.201 |
| □ | ✕ | 2004-10-03 10:46:52 | HTTP | /help.php? | 200 | 192.168.1.201 |
| □ | ✕ | 2004-10-03 10:46:52 | HTTP | /uploaded/logo.gif | 304 | 192.168.1.201 |
| □ | ✕ | 2004-10-03 10:46:51 | HTTP | /help.php?topic=Registering | 200 | 192.168.1.201 |
| □ | ✕ | 2004-10-03 10:46:51 | HTTP | /uploaded/logo.gif | 304 | 192.168.1.201 |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Blocked column**

The second column may contain a red **X** which indicates that this request was blocked.

**Time**

Date and Time of request

**Type**

Protocol of the request (HTTP/HTTPS)

**Requested Object**

This field displays the requested URI.

**Note**

Click a specific object to view the full contents of the request, and the View Full Request Information window is displayed.

**Response**

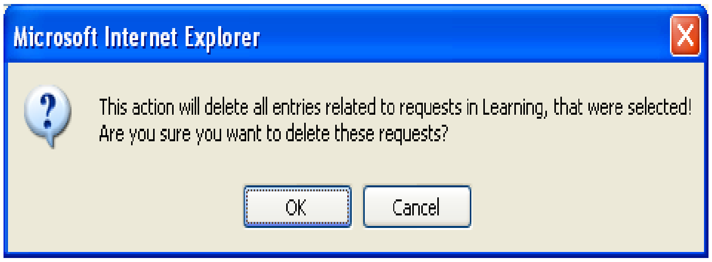
This field is the server HTTP response status.

**Source IP**

This is the IP address of the client machine that issued the request.

### Actions available for Ignored Requests

- **Clear**: Clicking Clear deletes the checked entries from this window without changing the policy. The following confirmation window is displayed.



Microsoft Internet Explorer

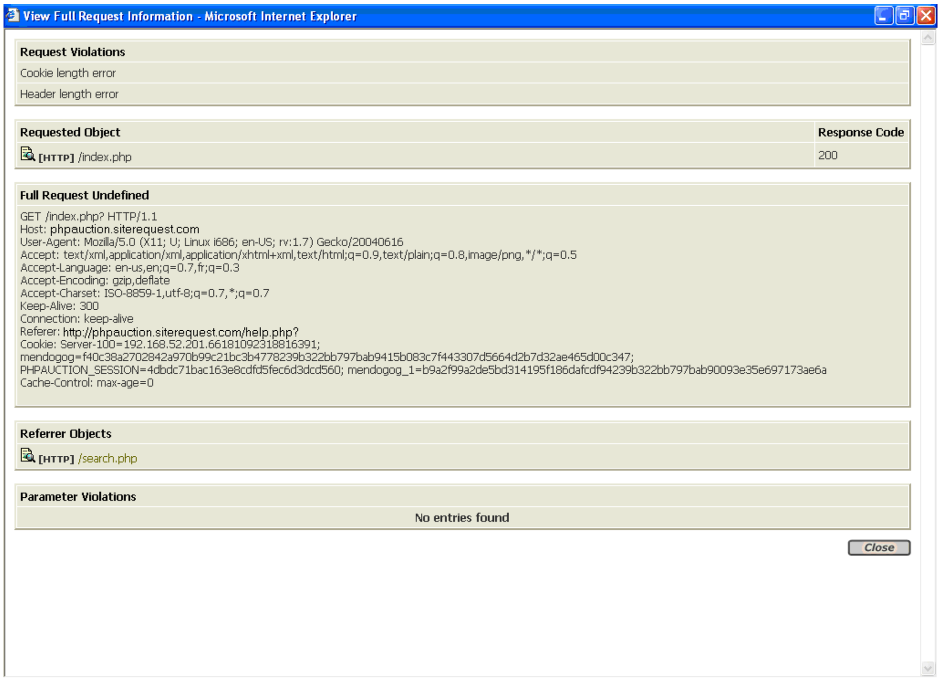
This action will delete all entries related to requests in Learning, that were selected!
Are you sure you want to delete these requests?

- **Clear All**: Clicking Clear All deletes all entries from this learning window without changing the policy, regardless of whether they are checked or not. You will be asked to confirm this.

# View Full Request Information window

You can access this window from both the Learning and the Forensic areas.

Following is an example of the type of information displayed when you choose to open this window.



| Request Violations |
|---|
| Cookie length error |
| Header length error |

| Requested Object | Response Code |
|---|---|
| [HTTP] /index.php | 200 |

Full Request Undefined

```
GET /index.php? HTTP/1.1
Host: phpauction.siterequest.com
User-Agent: Mozilla/5.0 (X11; U; Linux i686; en-US; rv:1.7) Gecko/20040616
Accept: text/xml,application/xml,application/xhtml+xml,text/html;q=0.9,text/plain;q=0.8,image/png,*/*;q=0.5
Accept-Language: en-us,en;q=0.7,fr;q=0.3
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Referer: http://phpauction.siterequest.com/help.php?
Cookie: Server-100=192.168.52.201.66181092318816391;
mendogog=f40c38a2702842a970b99c21bc3b4778239b322bb797bab9415b083c7f443307d5664d2b7d32ae465d00c347;
PHPAUCTION_SESSION=4dbdc71bac163e8cdfd5fec6d3dcd560; mendogog_1=b9a2f99a2de5bd314195f186dafcdf94239b322bb797bab90093e35e697173ae6a
Cache-Control: max-age=0
```

| Referrer Objects |
|---|
| [HTTP] /search.php |

| Parameter Violations |
|---|
| No entries found |

**Request Violations**
This is the list of all encountered violations created by the request.

**Requested Object**
This is the object part of the request URI.

**Full Request Undefined**
This section displays the entire request including the HTTP headers and user input (Query String or POST Data).

**Referrer Objects**
These are the referrer objects according to the policy.

**Parameter Violations**
This is the list of input violations per parameter in the request, where applicable.

# Policy Component Editing

This section of this chapter explains in detail how to manually edit all the policy components. The assumption is that the TrafficShield security policy has already been created by using a combination of tools: the Policy Browser, the Crawler, and the Learning module.

We do not recommend that you manually create a security policy from scratch, due to the enormous complexity of the task, although theoretically it is possible.

The Crawler builds a usable policy that checks all the objects and flows of the Web application. Manual intervention may be needed if you want to override the definitions generated by the Crawler. For example, you may remove an object from the policy if you do not want TrafficShield security application to check requests that refer to it or you can enter regular expressions to enhance the checks.

Most of the modifications made to a policy are typically done through the Learning tables. For example, you can add a missing object through a single click once the Learning process has determined that the object should be part of the policy. Refer to the beginning of this chapter for more details on the Learning process.

# Object Types

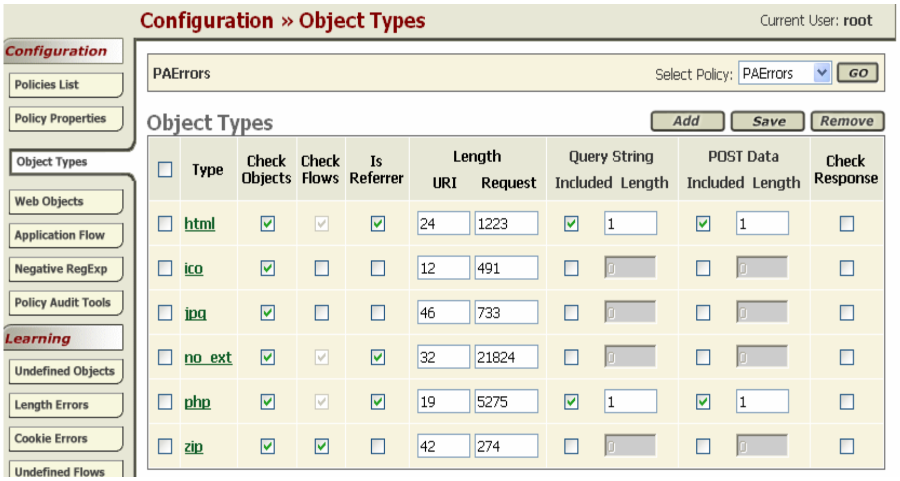
The Object Types tab lists the existing file types in the protected Web site. For example, a list of valid object types for a specific policy could be: gif, jpg and html only. If your policy contains the above list, then any request for a PDF file would be considered illegal.

The extensions are listed here to enable you to decide how the policy should react to requests that refer to files that have these extensions.

Each entry in the table is composed from the object type, and the object type's set of flags and values. When adding a new object to the policy, this set of flag and values is the default settings applied to the object.

**Note**

A special entry of "no_ext" file type is created in the object type table to handle the following cases: Objects with no file extension, and Objects with file extensions longer than 8 characters.



PAErrors

Select Policy: PAErrors

Object Types

| □ | Type | Check Objects | Check Flows | Is Referrer | Length | | Query String | | POST Data | | Check Response |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | URI | Request | Included | Length | Included | Length | |
| □ | html | ☑ | ☑ | ☑ | 24 | 1223 | ☑ | 1 | ☑ | 1 | □ |
| □ | ico | ☑ | □ | □ | 12 | 491 | □ | 0 | □ | 0 | □ |
| □ | jpg | ☑ | □ | □ | 46 | 733 | □ | 0 | □ | 0 | □ |
| □ | no_ext | ☑ | ☑ | ☑ | 32 | 21824 | □ | 0 | □ | 0 | □ |
| □ | php | ☑ | ☑ | ☑ | 19 | 5275 | ☑ | 1 | ☑ | 1 | □ |
| □ | zip | ☑ | ☑ | □ | 42 | 274 | □ | 0 | □ | 0 | □ |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Type**

This is the file extension. Clicking on the object type link leads you to a list of Web objects of this type.

**Note**

The Type field is case-sensitive; for example you can add both html and HTML and they will be treated as different object types.

**Check Objects**

If this checkbox is checked, TrafficShield security application checks requests for this object type to verify that the actual object exists in the Web application or is accessible via the application flow.

If this checkbox is unchecked, TrafficShield security application lets through requests for this object type without checking whether the actual object exists in the Web application or is accessible via the application flow.

**Tip**

If the Web application changes frequently ,(i.e., a set of objects in the Web application are changed frequently) it is not a good idea to clear this box, in order to avoid massive warnings and rejections. We recommended that you read the Allowed Objects RegExp – Object list relaxation section

objects.

**Check Flows**

The Application Flow (path) is the defined access path leading from one object to another object.

Check this box to instruct the TrafficShield security application to test whether the requested object from a given object type is a legal flow.

For example, a list of valid flows would be:

- From abc.html to abc.gif, OK
- From abc.html to def.html, OK

If your policy contains the above list, then any request that tries to access abc.gif from def.html would be considered illegal.

If you clear the box, any request accessing this file is considered as legal, even if it did not originate from a legal flow.

### Application flow model

TrafficShield security application maps all the possible user actions in a web application, including parameter and values. Any non-recognized action can then be considered an attack, and blocked.

#### Is Referrer

Check this box if objects of this object type may refer to other files. For example, HTML pages containing a link or CGI files calling another file, are referrers. Pictures and sound files cannot be referrers because these objects never contain links to other objects and are not web pages.

#### Length URI

This field defines the maximum legal length of the object's full path for this object type.

#### Length Request

This field defines the maximum legal length of the entire request.

#### Query String Included

Check this checkbox if requests for objects of this object type may include user input in the query string part of the request. A query string requests data in the format …abc.html?Name=John.

**Tip**

If the query string is empty, i.e., nothing is written after the question mark, the TrafficShield security application considers the request as an empty query string.

#### Query String Length

This field defines the maximum legal length of the user input in the query string part of the request. For example: In the following request, abc.html?Name=John&X=2, the actual query string length is 13 (Name=John&X=2).

#### POST Data Included

Check this checkbox if requests for objects of this object type may include user input in the POST data part of the request.

**POST Data Length**

This field defines the maximum legal length of the POST request user input data.

**Check-Response**

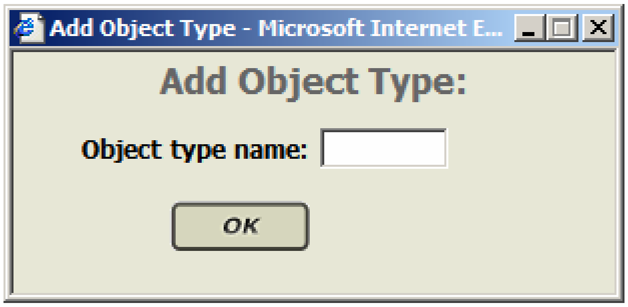
Check this checkbox to activate Server response filtering by the TrafficShield security application. If checked, the html body of the response will be tested vs. the Negative Regular expression applied to the Server response. See the Negative RegExp section in this chapter.

*To add an Object Type Manually:*

If the Web application includes objects of a type not listed here, you can add them manually.

1. In Object Types, click the Add button.

   The Add Object Type popup window opens.



2. Enter the file extension and click OK. (Type the extension without the period that appears in front of the extension.)
3. In the Object Types page, review the flags and values and set the policy for this object type, as explained above.
4. To save the changes, check the left checkbox next to the relevant entries and click the Save button.

**Note**

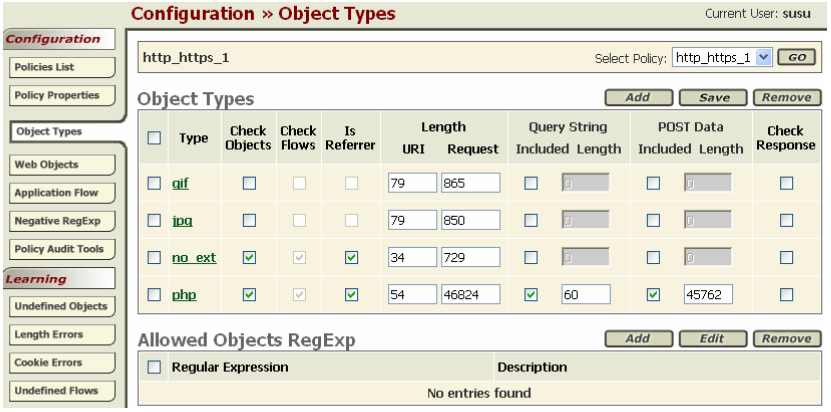
In order to remove an object type, check the left checkbox next to the relevant entries and click the Remove button. All existing objects of this object type and all relevant flows and parameters will be removed from the policy.

## Allowed Objects RegExp – Object list relaxation

The object list for a specific object type is enforced by the TrafficShield security application. If the Check Object flag is set for a specific object, any request containing an object that is not on the list will create a "non-existent object" violation.

This section explains how to lessen this severe restriction for a specific object type.

This situation is inconvenient if the Web application is dynamic and the set of objects of a given object type changes frequently. Adding and editing the object list manually or via the Learning process may become a complicated and endless task.



http_https_1

Object Types

| □ | Type | Check Objects | Check Flows | Is Referrer | Length | | Query String | | POST Data | | Check Response |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | URI | Request | Included | Length | Included | Length | |
| □ | gif | □ | □ | □ | 79 | 865 | □ | 0 | □ | 0 | □ |
| □ | jpg | □ | □ | □ | 79 | 850 | □ | 0 | □ | 0 | □ |
| □ | no_ext | ☑ | ☑ | ☑ | 34 | 729 | □ | 0 | □ | 0 | □ |
| □ | php | ☑ | ☑ | ☑ | 54 | 46824 | ☑ | 60 | ☑ | 45762 | □ |

Allowed Objects RegExp

| □ | Regular Expression | Description |
|---|---|---|
| | No entries found | |

To resolve this problem, it is possible to define regular expressions describing the set of possible objects.

*To define expressions as a set of possible objects:*

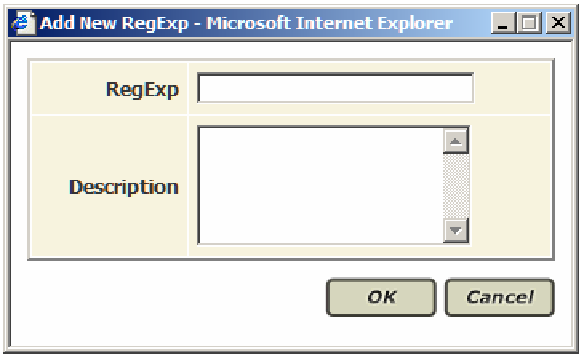
In the Allowed Objects RegExp section (located at the bottom of the Object Types window) follow these steps:

1. Set "check objects" to true.
2. Define regular expression\s describing the set of possible objects as explained below.

*To add a regular expression:*

1. Click the Add button.

   The Add New RegExp dialog box opens.



2. In RegExp, enter the expression. For example, if the policy contains objects a.gif and b.gif only, the regular expression *\.gif$ will allow any object of a gif object type.

3. Click *OK*.

# Web Objects

After reviewing the object types, you can examine each object separately and fine-tune the security attributes for each of them.

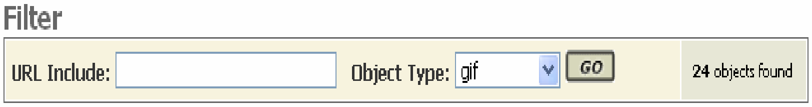
An important policy decision to make at this stage is to decide whether a certain object is an *entry point* or not.

An entry point is a page through which a visitor should enter the Web application as designed by the Web Master of the application; for example, by typing its URL in the browser's address box, or by selecting its URL from a favorites list.

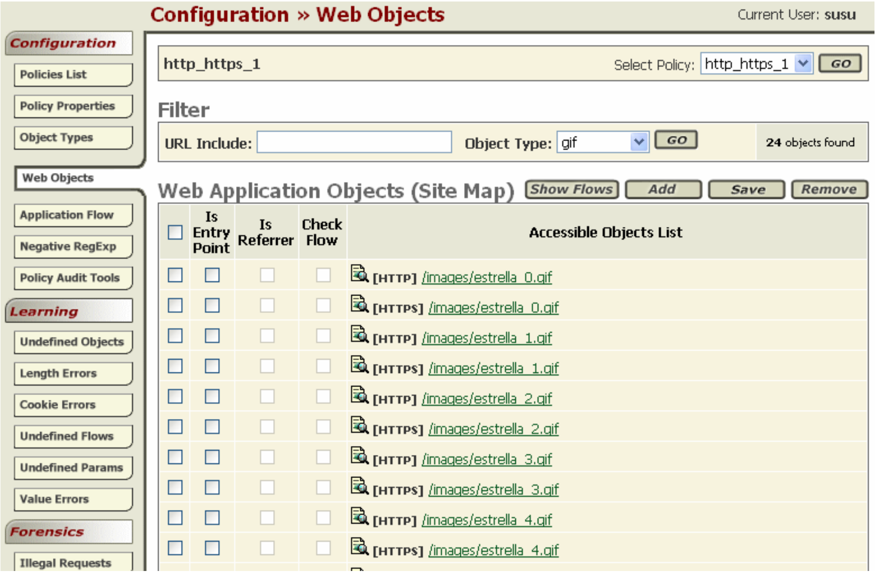
Your Web application may have several entry points. By defining objects that are entry points, you prevent an attacker from entering your Web application without passing through the "front door."

It is possible to access the object list relating to a specific object type in two different ways:

- Choose Policy Management-> Configuration-> Web Objects. Choose the relevant object type in the drop down menu, and click the *GO* button.



- Choose Policy Management-> Configuration-> Objects Types. Click on the Object Type link, and the relevant object list is automatically displayed.



Configuration » Web Objects

Current User: susu

http_https_1 Select Policy: http_https_1

Filter

URL Include: Object Type: gif 24 objects found

Web Application Objects (Site Map)

| □ | Is Entry Point | Is Referrer | Check Flow | Accessible Objects List |
|---|---|---|---|---|
| □ | □ | □ | □ | [HTTP] /images/estrella_0.gif |
| □ | □ | □ | □ | [HTTPS] /images/estrella_0.gif |
| □ | □ | □ | □ | [HTTP] /images/estrella_1.gif |
| □ | □ | □ | □ | [HTTPS] /images/estrella_1.gif |
| □ | □ | □ | □ | [HTTP] /images/estrella_2.gif |
| □ | □ | □ | □ | [HTTPS] /images/estrella_2.gif |
| □ | □ | □ | □ | [HTTP] /images/estrella_3.gif |
| □ | □ | □ | □ | [HTTPS] /images/estrella_3.gif |
| □ | □ | □ | □ | [HTTP] /images/estrella_4.gif |
| □ | □ | □ | □ | [HTTPS] /images/estrella_4.gif |

### URL Include (Filter bar)

Use this field to view a subset of the object list. For example; type a string to list all the objects containing this string.

**Note**

Each object in the list has a prefix which indicates the protocol (HTTP/HTTPS) through which this object may be requested. This may cause the same object to be displayed twice in the object list if relevant to both protocols.

**Tip**

This search is case-sensitive.

### Select box column

The first column contains checkboxes used to mark the relevant entry.

### Is Entry Point

The Crawler defines some objects as entry points during its run. These objects are likely to be bookmarks or they were pre-defined as entry points in the Policy Management->Policy Properties-> Crawler-Settings-> File Types Associations. We recommend that you review these entry point definitions.

### Is Referrer

Check this box if this object may refer to other objects. For example, HTML pages containing a link or CGI files calling another file, are referrers. Pictures and sound files cannot be referrers because these objects never contain links to other objects, and are not web pages.

**Check Flow**

The Application Flow (path) is the defined access path leading from one object to another.

Check this box to instruct the TrafficShield security application to test whether the requested object is a legal flow.

For example, a list of valid flows would be:

- From abc.html to abc.gif, OK
- From abc.html to def.html, OK

If your policy contains the above list, then any request that tries to access abc.gif from def.html would be considered illegal.

If you clear the box, any request accessing this file will be considered as legal even if it did not originate from a legal flow.

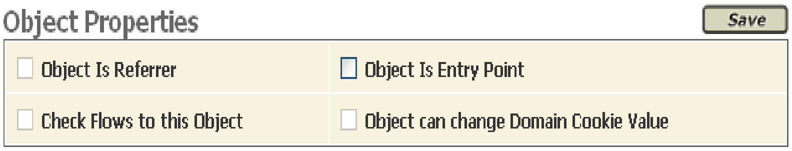
**Accessible Objects List**

Object list that answers the filter criteria. To open the Object Properties Window for a specific object in the list, click the object link. This window is divided into three parts:

- Object Properties
- Flows to Object
- Dynamic Flows from Object

### Object Properties

This section defines the object flags as displayed in the upper level, Web Objects tab.



Object Properties

Save

|  |  |
|---|---|
| □ Object Is Referrer | □ Object Is Entry Point |
| □ Check Flows to this Object | □ Object can change Domain Cookie Value |

**Object is Referrer**

Check this box if this object may refer to other objects. For example, HTML pages containing a link or CGI files calling another file, are referrers. Pictures and sound files cannot be referrers because these objects never contain links to other objects, and are not web pages.

**Object is Entry Point**

The Crawler defines some objects as entry points during its run. These objects are likely to be bookmarks, or they were pre-defined as entry points in the Policy Management->Policy Properties-> Crawler-Settings-> File Types Associations. We recommend that you review these entry point definitions.

**Check Flows to this Object**

The Application Flow (path) is the defined access path leading from one object to another.

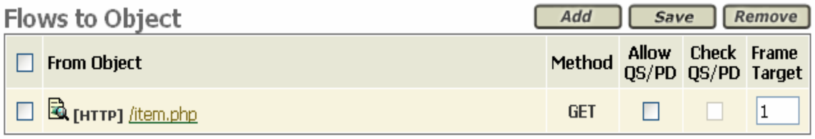
Check this box to instruct the TrafficShield security application to test whether the requested object is a legal flow.

**Object can change Domain Cookie Value**

If the object is a referrer, then this box can be checked. If the domain cookie was changed on the client side (i.e., Java script function execution by browser), then the TrafficShield security application will fail any request if this checkbox is not checked for this object and the object is a referrer in the incoming request.

## Flows to Object

This section summarizes the flows to the object.



| □ | From Object | Method | Allow QS/PD | Check QS/PD | Frame Target |
|---|---|---|---|---|---|
| □ | [HTTP] /item.php | GET | □ | □ | 1 |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**From Object**

This column lists the objects from which the object could be accessed.

**Note**

Click the object link to view the flow properties.

**Method**

This column specifies the method through which the object should be accessed.

**Allow QS/PD**

Check this checkbox to define whether user input is allowed.

**Check QS/PD**

If user input was allowed, then check this checkbox to enforce user input validations.

**Frame Target**

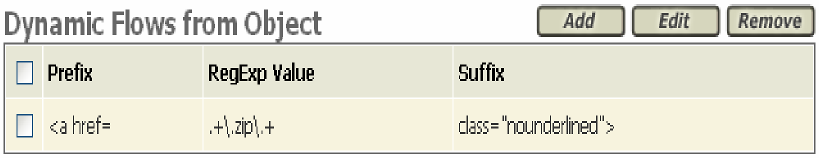
This is the index of the HTML frame targeted by the flow. We do not recommend that you change this value unless you know that you want to specifically load this object into a specific frame.

> **Note**
>
> The value 99 is a default frame index which means that the target object is loaded into the same frame as where the referrer object is presented.

### Dynamic Flows from Object

Some flows cannot be foreseen because they involve a constantly changing set of objects. For example: a zone of the application where various users store files that external wizards can access, involves unpredictable flows if the users remove or add files daily.

In such cases, you can use the Dynamic Flows from Object section to legalize access to the changing sets of files.



Dynamic Flows from Object

| □ | Prefix | RegExp Value | Suffix |
|---|---|---|---|
| □ | <a href= | .+\.zip\.+ | class="nounderlined"> |

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Prefix**

This field is a fixed substring of the html source page. It may be a name of a section in combination with html tags; for example: "<h3>Flows2Object</h3>".

**RegExp Value**

This field defines a set of objects in the above mentioned dynamic group.

**Suffix**

The suffix is similar to the prefix. For example: <form name=”dynamic_flows”>.

**Note**

The Prefix and Suffix instruct the TrafficShield security application of the boundaries that enclose the set of dynamic object links in a page. The TrafficShield security application uses the RegExp value as a pattern evaluate each object in the set between the boundaries.

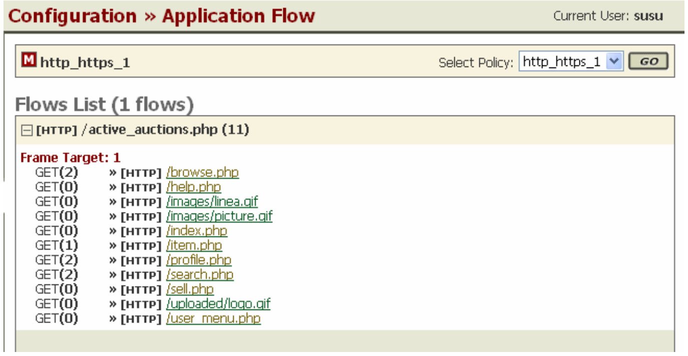
## Actions available for Web Application Objects

*To show the objects’ flows:*

1. Click the select checkbox for the objects you want details on.

2. Click the *Show Flows* button to display a list of flows in the Flow List Window for the checked objects.

   The Flow List window displays the list of checked objects. Each object can be expanded to display the outgoing flows. For more details please see the following section on Application Flows.



Configuration » Application Flow

Current User: susu

http_https_1

Select Policy: http_https_1

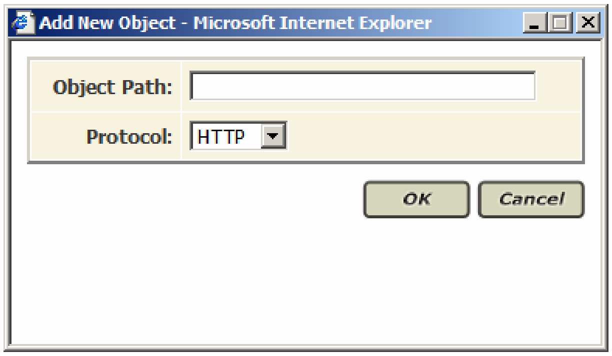
Flows List (1 flows)

```
⊟ [HTTP] /active_auctions.php (11)

Frame Target: 1
   GET(2)      » [HTTP] /browse.php
   GET(0)      » [HTTP] /help.php
   GET(0)      » [HTTP] /images/linea.gif
   GET(0)      » [HTTP] /images/picture.gif
   GET(0)      » [HTTP] /index.php
   GET(1)      » [HTTP] /item.php
   GET(2)      » [HTTP] /profile.php
   GET(2)      » [HTTP] /search.php
   GET(0)      » [HTTP] /sell.php
   GET(0)      » [HTTP] /uploaded/logo.gif
   GET(0)      » [HTTP] /user_menu.php
```

*To add an object manually:*

1. If you want to manually add an object without running the Crawler again, click the *Add* button and the Add New Object window opens.

   **Object Path:**
   Enter the full resource path starting with the slash [/].

   **Protocol:**
   Specify the protocol to be used to access the object.

2. In the Web Objects tab, review and edit the flags and values for the new object.

3. Check the modified entry's checkbox, and click the Save button.

*To remove an object:*

1. In the Web Application Objects list, check the relevant objects to be removed.

2. Then click the Remove button. You will be asked to confirm the removal.

# Application Flow

The Application Flow is the defined access path leading from one object to another object.

These flows are populated from various sources: The Crawler generates a map of the flows from within the Web application, by scanning the links and references within the objects. The Learning process results in acceptance of new flows. It is also possible to manually add and edit application flows.

*To access the Application Flow:*

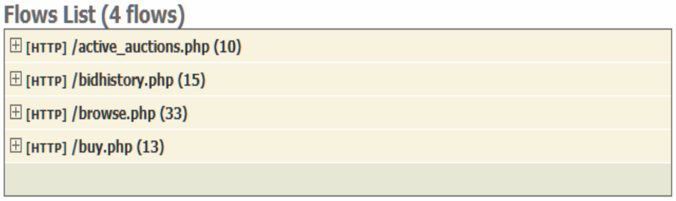
The Application Flow can be accessed in any of the following three ways:

**Choose Policy Management-> Configuration -> Web Objects tab**

1. Then click the desired object's URL link. The Flows to object section of the page, displayed now, lists the objects from which the selected file can be reached.
2. Click the "From Object" link to display the Application Flow window.

**Choose Policy Management-> Configuration -> Web Objects tab**

1. Then check the checkbox to the left of the relevant object (you can check more than one, if you want) and click the Show Flows button. This displays, at first, a list of the objects you have just marked.



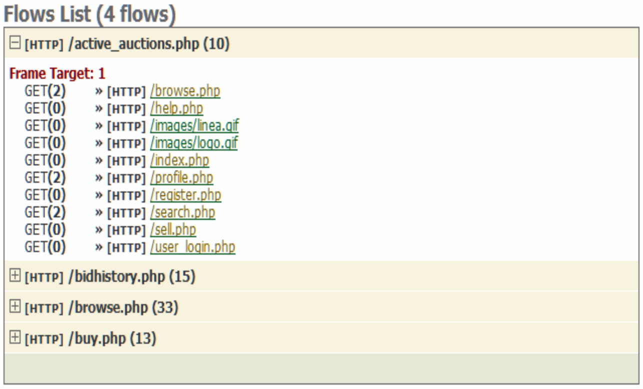
Flows List (4 flows)

⊞ [HTTP] /active_auctions.php (10)

⊞ [HTTP] /bidhistory.php (15)

⊞ [HTTP] /browse.php (33)

⊞ [HTTP] /buy.php (13)



```
Flows List (4 flows)
⊟ [HTTP] /active_auctions.php (10)
Frame Target: 1
   GET(2)      » [HTTP] /browse.php
   GET(0)      » [HTTP] /help.php
   GET(0)      » [HTTP] /images/linea.gif
   GET(0)      » [HTTP] /images/logo.gif
   GET(0)      » [HTTP] /index.php
   GET(2)      » [HTTP] /profile.php
   GET(0)      » [HTTP] /register.php
   GET(2)      » [HTTP] /search.php
   GET(0)      » [HTTP] /sell.php
   GET(0)      » [HTTP] /user_login.php
⊞ [HTTP] /bidhistory.php (15)
⊞ [HTTP] /browse.php (33)
⊞ [HTTP] /buy.php (13)
```

2. Click the **+** button to see a list of the actual files that can be reached from the object you selected originally. If the reference targets a frame in a frameset, then the index of the target frame appears at the top of the referenced files. Click the "To Object" link to display the Flow window.

   **Note**

   Destination Objects are listed under the Frame Target Index into which they should be loaded by the application. Each entry specifies:

   i. The method used to access the target object.

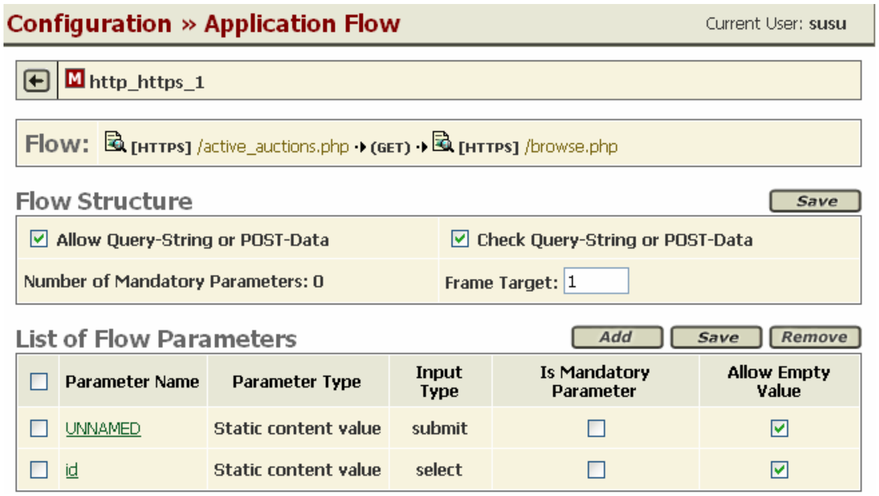
   ii. The number of known input parameters in ().

   iii. A protocol to request the target object.

   iv. Colorization of the targeted objects is used to differentiate between the Is Referrer flag settings (Brown=flag set to true, Green=flag set to false).

**Click the Application Flow tab.**

You see a list of all flows.



Flow: [HTTPS] /active_auctions.php → (GET) → [HTTPS] /browse.php

Flow Structure

☑ Allow Query-String or POST-Data

☑ Check Query-String or POST-Data

Number of Mandatory Parameters: 0

Frame Target: 1

List of Flow Parameters

| □ | Parameter Name | Parameter Type | Input Type | Is Mandatory Parameter | Allow Empty Value |
|---|---|---|---|---|---|
| □ | UNNAMED | Static content value | submit | □ | ☑ |
| □ | id | Static content value | select | □ | ☑ |

The TrafficShield security application allows the user to view and edit the Query String and the POST Data. The flow parameters configuration is only accessible from these windows.

## Flow Structure

### Allow Query-String or POST-Data

Check this box if a request that accesses the selected object via this specific flow may also carry a query string or POST data.

### Check Query-String or POST-Data

Check this box to instruct TrafficShield security application to perform validity checks on the query string and the POST data. This relevant only if you already checked the Allow Query-String or POST-Data checkbox.

### Number of Mandatory Parameters:

This number represents the number of parameters that must pass from the source to the destination object in this flow. This counter is updated automatically as additional parameters are marked as mandatory.

### Frame Target:

This is the index of the HTML frame targeted by the flow. We do not recommend that you change this value unless you know that you want to specifically load this object into a specific frame.

**Note**

The value 99 is a default frame index which means that the target object is loaded into the same frame as where the referrer object is presented.

## List of Flow Parameters

**Select box column**

The first column contains checkboxes used to mark the relevant entry.

**Parameter Name**

This column displays a list of the flow parameters.

**Note**

The Parameter Name "UNNAMED" is used for actual parameters on the flow that don't have a name.

**Parameter Type**

This field specifies the parameter type. See the parameter section below for details on the parameter types.

**Input Type**

This field defines the html input type of the parameter as it appears in the html source page.

**Is Mandatory Parameter**

Check this checkbox if this parameter must appear in the flow.

**Allow Empty Value**

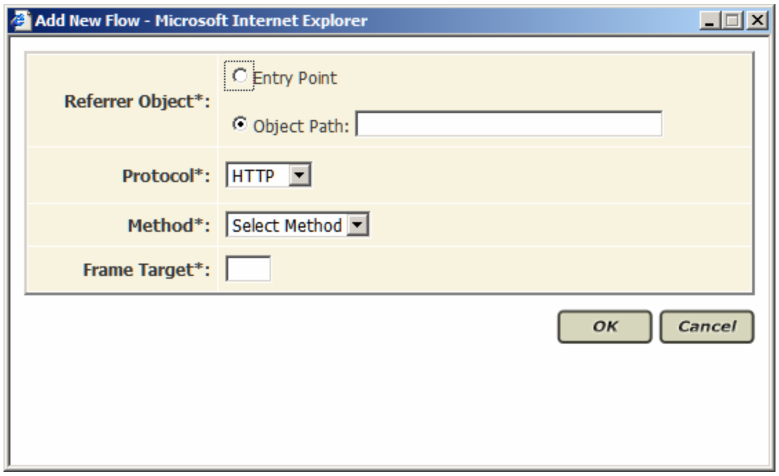
Check this checkbox to allow the parameter to contain an empty value.

*To manually add a Flow:*

This section explains how to add a new Application flow. Click *OK* after entering the new flow's information and click the Save button to save your changes.

1. Choose the Policy Management -> Configuration -> Web Objects tab.
2. Check the relevant object to which you want to add a new flow definition.
3. Click the Add button.

   The Add New Flow window opens:



| | |
|---|---|
| Referrer Object*: | ○ Entry Point<br>● Object Path: |
| Protocol*: | HTTP |
| Method*: | Select Method |
| Frame Target*: | |

**Referrer Object**

There are two possible referrer object types:

**Entry Point**

Choose this option if the object to which the flow should be added is an entry point.

**Object Path**

Choose this option and specify the referrer object path from which the target object should be accessed.

**Protocol:**

Specify the protocol type by which the target object should be accessed.

**Method:**

Choose the method by which the target object should be accessed.

**Frame Target:**

This is the index of the HTML frame targeted by the flow. We do not recommend that you change this value unless you know that you want to specifically load this object into a specific frame.

**Note**

The value 99 is a default frame index which means that the target object is loaded into the same frame as where the referrer object is presented.

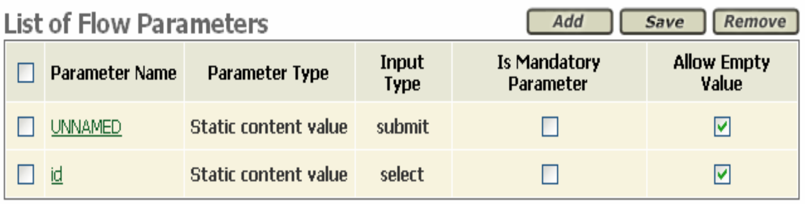
**Tip**

In order to decide what to enter to the frame target index field, the html source page should be reviewed for frame set tags.

# Flow Parameters

This section describes the parameter properties and its configuration.

1. To access this window, choose the Policy Management –> Configuration -> Web Objects tab.
2. In the Web Objects window, choose the "target object."
3. From the list of Flows to Object, choose the "from object."
4. The Application Flow window appears and displays a List of Flow Parameters.



| □ | Parameter Name | Parameter Type | Input Type | Is Mandatory Parameter | Allow Empty Value |
|---|---|---|---|---|---|
| □ | UNNAMED | Static content value | submit | □ | ☑ |
| □ | id | Static content value | select | □ | ☑ |

**Select box column**

The first column contains checkboxes used to mark the relevant entry

**Parameter Name**

Specify the name of the parameter as it appears in the request.

To view and edit the parameter properties click the Parameter Name link. The Edit Parameter window appears. See the following section, *To add a new Parameter to the Flow*, for more details about this window.

**Parameter Type**

This field specifies the parameter type.

**Input Type**

This field defines the html input type of the parameter as it appears in the html source page.

**Is Mandatory Parameter**

Check this checkbox if this parameter must appear in the flow.

**Allow Empty Value**

Check this checkbox to allow the parameter to contain an empty value.

*To add a new Parameter to the Flow:*

Click the Add button in the List of Flow Parameters section in the Web Application tab.

**Note**

The window contains two sections. In the top section, Add Parameter, the Parameter's general information is entered. The selected parameter type automatically changes the appearance and content of the bottom section. For example if you choose to add a parameter of a "static content value" type, the bottom section will display the Parameter Static Values screen.

## The optional Parameter types are:

**Don't Check Value**

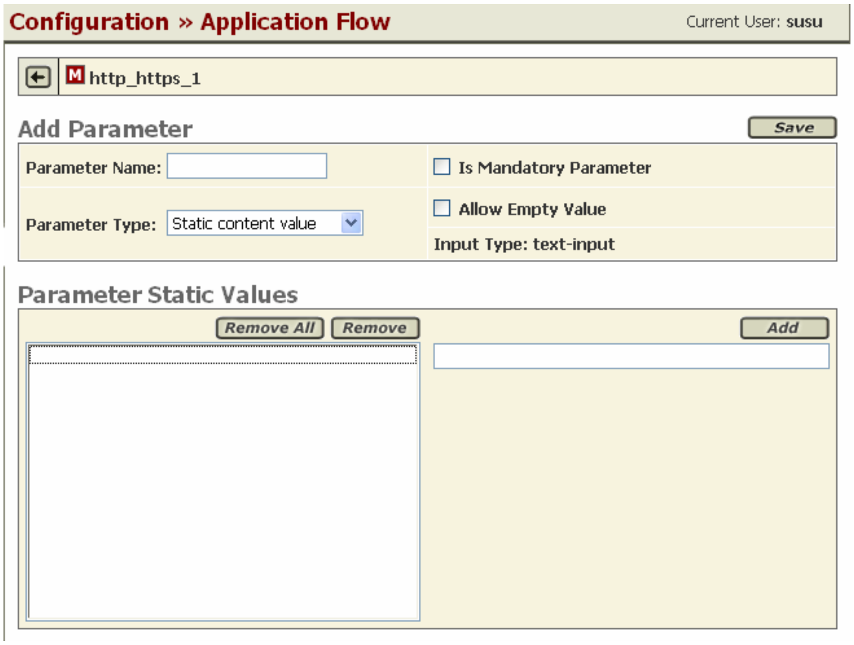
Select this option if you do not want TrafficShield security application to check the parameter value at all. If you choose this option, no bottom section appears in the window.

**Note**

A parameter defined as Don't Check Value must have a value in the request. The TrafficShield security application will not check its validity, but it will check its existence. To disable this functionality, check the Allow Empty Value box: this makes sure that empty parameters are also allowed.

**Static Content Value**

Select this option if users must select the value from a pre-defined list of values such as values found in a drop-down list or a list of values accessed via radio buttons. When this option is selected, the Parameter Static Values section appears.



Configuration » Application Flow

Current User: susu

http_https_1

Add Parameter

Parameter Name:

Parameter Type: Static content value

□ Is Mandatory Parameter

□ Allow Empty Value

Input Type: text-input

Parameter Static Values

*To build a list of pre-defined values*

1. In the box next to the Add button, enter a value.
2. Click Add. The value moves to the larger box.
3. Repeat this step to define all the values needed.

*To remove a value from the list*

1. Select the value and click the Remove button.

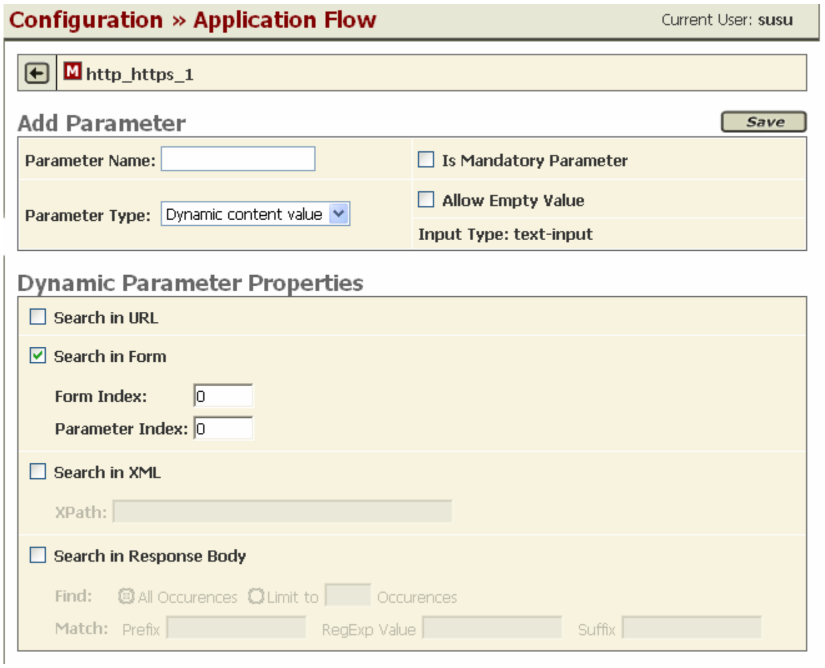
   The Remove All button clears the entire list.

**Note**

If the value list is empty for this parameter type, an illegal static parameter value violation is issued for any value received in this parameter in the request.

## Dynamic Content Value

Use this option if the parameter value changes dynamically and the location of the value in the request cannot be foreseen. In this case, you instruct the TrafficShield security application to actually search for the value in the various sections of the request.



Add Parameter

Parameter Name:

Parameter Type: Dynamic content value

□ Is Mandatory Parameter

□ Allow Empty Value

Input Type: text-input

Dynamic Parameter Properties

□ Search in URL

☑ Search in Form

Form Index: 0

Parameter Index: 0

□ Search in XML

XPath:

□ Search in Response Body

Find: ○ All Occurences ○ Limit to Occurences

Match: Prefix RegExp Value Suffix

Enter the following information (you can run the search in one or more of the sections described below):

**Search In URL**
Check this box to instruct TrafficShield security application to search for the parameter value in the URL section of the request.

**Search in Form**
Check this box to instruct TrafficShield security application to search for the parameter value in one of the forms.

- In Form Index, specify the HTML index of the form that contains the parameter.
- In Parameter Index, specify the HTML index of the input parameter in the form that contains it.

**Search in XML**
Check this box to instruct TrafficShield security application to search for the parameter value in an XML block included in the request.

- In the XPath box, specify the XML tag path (e.g., <products><productPrices> <productSalesPrice>) where to look for the value.

**Search in Response Body**

Check this box to instruct the TrafficShield security application to search for the parameter value between two specific strings in the body of the request.

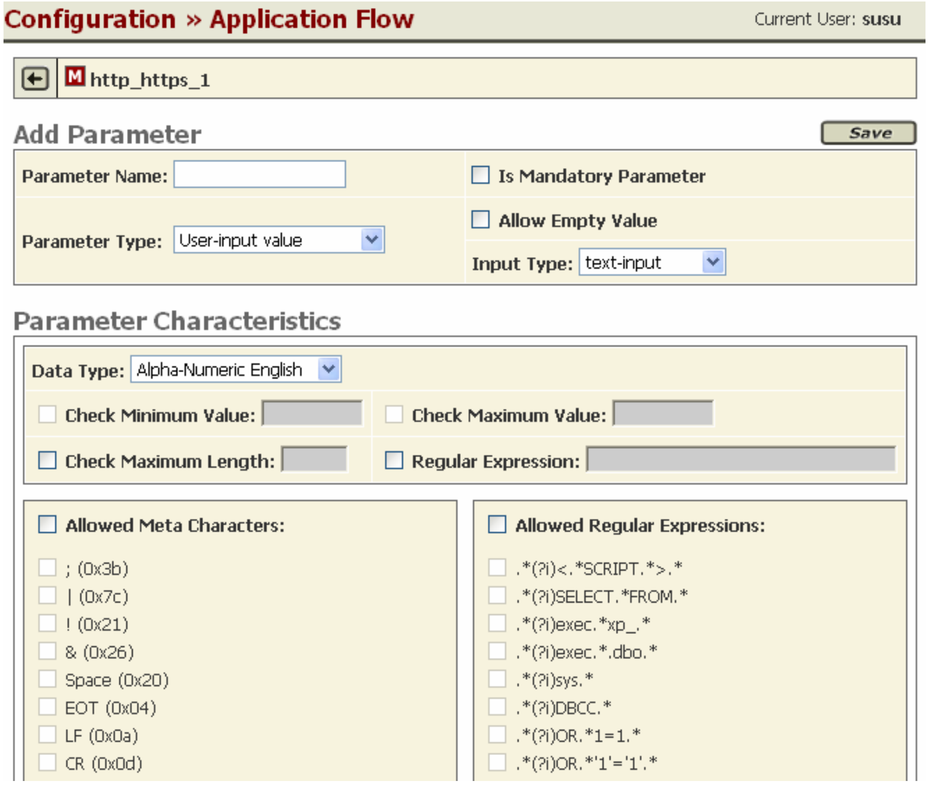
Enter the following information:

| Item | Description |
|---|---|
| **Find:** | |
| All Occurrences | Select this option to search for all occurrences of the value. |
| Limit to… Occurrences | Select this option to search fore the first x occurrences of the value. Specify the number of occurrences to find. |
| **Match** | |
| Prefix | Enter the string that constitutes the starting point of the search in the request body. |
| RegExp Value | Enter a regular expression that describes the searched value (and parameter name, if necessary). |
| Suffix | Enter the string that constitutes the ending point of the search in the request body. |

## Parameter Characteristics User Input Values

Select this option if the parameter accepts input from the user. For example it may be applied to html text area, input box, etc.

This option allows you to set the value's data type and to define the characters it may contain.



**Configuration » Application Flow** Current User: susu

http_https_1

**Add Parameter**

| | |
|---|---|
| Parameter Name: | □ Is Mandatory Parameter |
| Parameter Type: User-input value | □ Allow Empty Value<br>Input Type: text-input |

**Parameter Characteristics**

Data Type: Alpha-Numeric English

| | |
|---|---|
| □ Check Minimum Value: | □ Check Maximum Value: |
| □ Check Maximum Length: | □ Regular Expression: |

| □ Allowed Meta Characters: | □ Allowed Regular Expressions: |
|---|---|
| □ ; (0x3b) | □ .*(?i)<.*SCRIPT.*>.* |
| □ \| (0x7c) | □ .*(?i)SELECT.*FROM.* |
| □ ! (0x21) | □ .*(?i)exec.*xp_.* |
| □ & (0x26) | □ .*(?i)exec.*.dbo.* |
| □ Space (0x20) | □ .*(?i)sys.* |
| □ EOT (0x04) | □ .*(?i)DBCC.* |
| □ LF (0x0a) | □ .*(?i)OR.*1=1.* |
| □ CR (0x0d) | □ .*(?i)OR.*'1'='1'.* |

### Data Type

Select the type of the parameter value. By selecting a type, you instruct the TrafficShield security application to consider as invalid any requests that contain data of a different type for this parameter.

| Select | To limit the value to |
|---|---|
| Alpha-Numeric *(language)* | Any text consisting of letters, digits and the underscore character. |
| Integer | Whole numbers only (no decimals). |
| Decimal | Numbers only (including decimals). |
| E-mail | Text in e-mail address format only. |
| Phone | Text in telephone number format only. |

Select the “Don’t check” option if you do not want the TrafficShield security application to check the type of the parameter value.

**Check Minimum Value**

For numeric parameters of Integer/Decimal types, you can set a minimum value. A request that passes a parameter with a lower value is then considered illegal.

To set the minimum value, check the box and enter the value.

**Check Maximum Value**

For numeric parameters of Integer/Decimal types, you can set a maximum value. A request that passes a parameter with a higher value is then considered illegal.

To set the maximum value, check the box and enter the value.

**Check Maximum Length**

This attribute applies to all data types except the Don’t check parameter type.

By setting a maximum length for parameters, you prevent unauthorized access via parameter values that have an unexpected length. For example, you can limit the length of an alpha-numeric value to 4 (characters) if it is never expected to contain more than 4 letters, and thus instruct the TrafficShield security application to consider as illegal any requests that contain a longer value.

To set the maximum length, check the checkbox and enter the maximum number of characters the value may contain.

**Regular Expression**

If the value is non-numeric, you can calculate it via a Regular Expression. To do so, check this checkbox and type the expression in the adjacent field.

This is a positive regular expression that defines what is legal.

**Allowed Meta Characters**

Use this section for characters defined as C (check) in the Character Sets table -> Parameter values in the Administration module. The TrafficShield security application will let through requests whose user input includes the characters marked here as valid. That is, C will be treated as Y (true). Please refer to the *Installation and Configuration Manual* for more details on CharSets.

**Allowed Regular Expressions**

This is a list of regular expression designed to protect Web applications from common attacks via user input, like XSS, SQL injections, etc.

The user may allow a specific RegExp if normal input of the parameter is expected to contain a value that matches the RegExp.

# Negative RegExp

The Negative Regular Expression tab contains a list of default and user defined regular expressions. These regular expressions are meant to complete the security policy definitions.

The request/response content that matches at least one negative regular expression should be dropped.

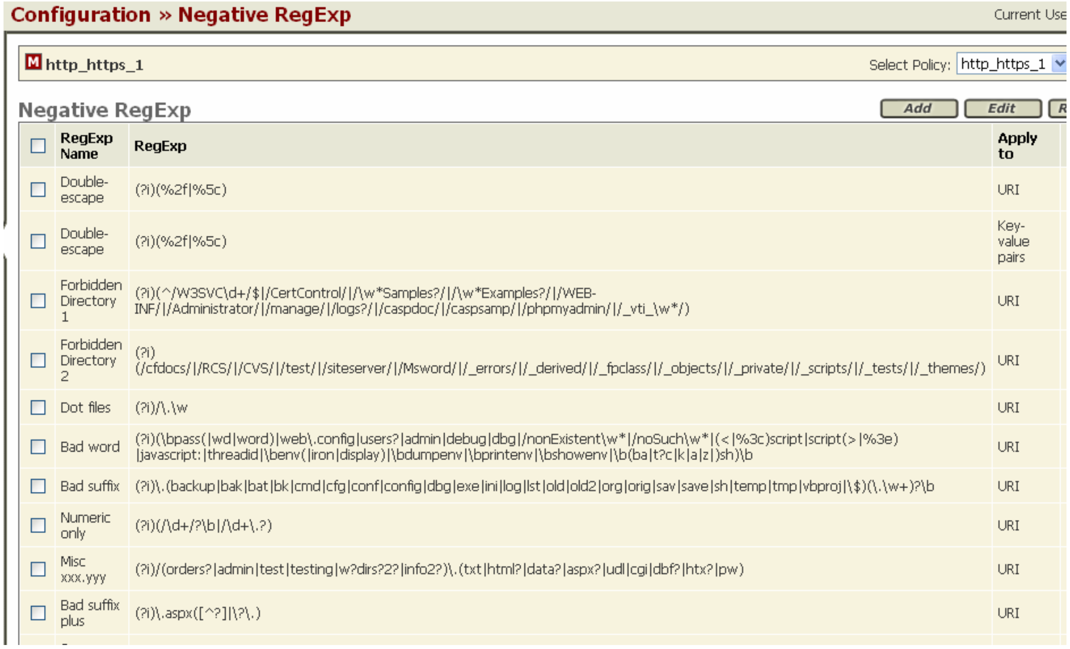
Each regular expression may be modified to apply to one of the following parts of the request/response:

a. Request URI

b. Request key value pairs

c. Request header values

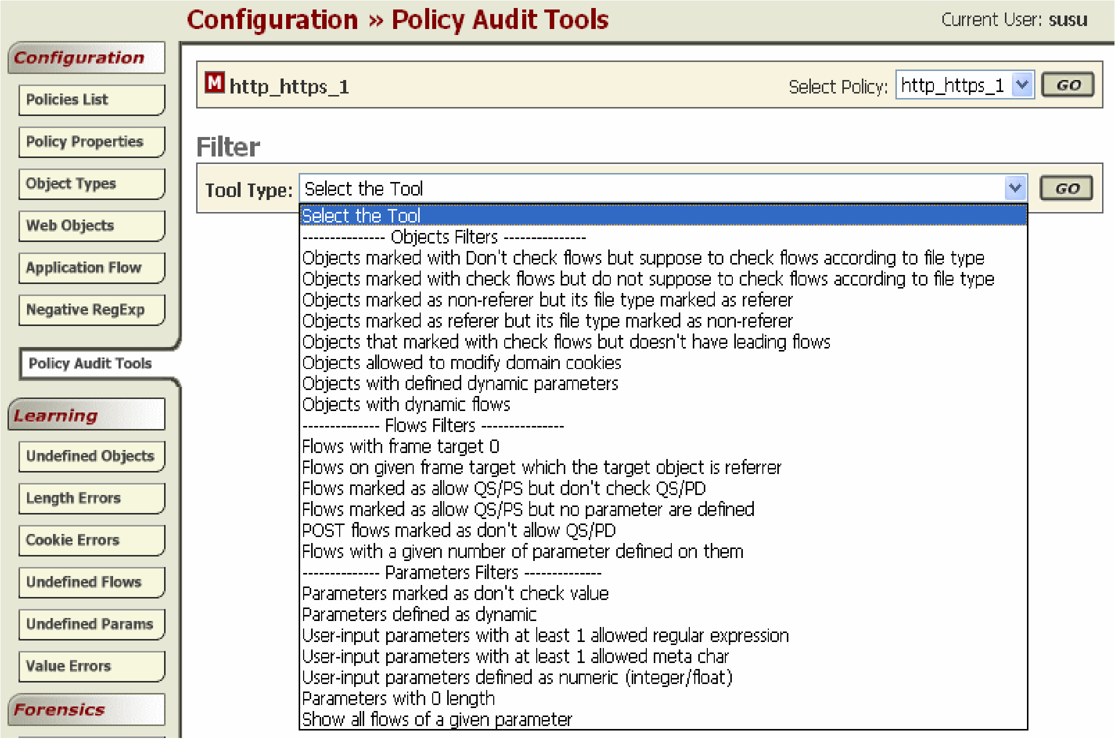
d. Server Response data (html body)



<table>
<tr><th>□</th><th>RegExp Name</th><th>RegExp</th><th>Apply to</th></tr>
<tr><td>□</td><td>Double-escape</td><td>(?i)(%2f|%5c)</td><td>URI</td></tr>
<tr><td>□</td><td>Double-escape</td><td>(?i)(%2f|%5c)</td><td>Key-value pairs</td></tr>
<tr><td>□</td><td>Forbidden Directory 1</td><td>(?i)(^/W3SVC\d+/$|/CertControl/|/\w*Samples?/|/\w*Examples?/|/WEB-INF/|/Administrator/|/manage/|/logs?/|/caspdoc/|/caspsamp/|/phpmyadmin/|/_vti_\w*/)</td><td>URI</td></tr>
<tr><td>□</td><td>Forbidden Directory 2</td><td>(?i)(/cfdocs/|/RCS/|/CVS/|/test/|/siteserver/|/Msword/|/_errors/|/_derived/|/_fpclass/|/_objects/|/_private/|/_scripts/|/_tests/|/_themes/)</td><td>URI</td></tr>
<tr><td>□</td><td>Dot files</td><td>(?i)/\.\w</td><td>URI</td></tr>
<tr><td>□</td><td>Bad word</td><td>(?i)(\bpass(|wd|word)|web\.config|users?|admin|debug|dbg|/nonExistent\w*|/noSuch\w*|(<|%3c)script|script(>|%3e)|javascript:|threadid|\benv(|iron|display)|\bdumpenv|\bprintenv|\bshowenv|\b(ba|t?c|k|a|z|)sh)\b</td><td>URI</td></tr>
<tr><td>□</td><td>Bad suffix</td><td>(?i)\.(backup|bak|bat|bk|cmd|cfg|conf|config|dbg|exe|ini|log|lst|old|old2|org|orig|sav|save|sh|temp|tmp|vbproj|\$)(\.\w+)?\b</td><td>URI</td></tr>
<tr><td>□</td><td>Numeric only</td><td>(?i)(/\d+/?\b|/\d+\.?)</td><td>URI</td></tr>
<tr><td>□</td><td>Misc xxx.yyy</td><td>(?i)/(orders?|admin|test|testing|w?dirs?2?|info2?)\.(txt|html?|data?|aspx?|udl|cgi|dbf?|htx?|pw)</td><td>URI</td></tr>
<tr><td>□</td><td>Bad suffix plus</td><td>(?i)\.aspx([^?]|\?\.)</td><td>URI</td></tr>
</table>

# Policy Audit Tools

The Policy Audit tools analyze suspicious policy states. For example: Object without flows, Parameters with zero length, etc. Each report isolates a pre-defined state and assists the user in identifying conflicts & errors in the policy.



Configuration » Policy Audit Tools

Current User: susu

http_https_1

Select Policy: http_https_1

Filter

Tool Type: Select the Tool

Configuration
Policies List
Policy Properties
Object Types
Web Objects
Application Flow
Negative RegExp
Policy Audit Tools
Learning
Undefined Objects
Length Errors
Cookie Errors
Undefined Flows
Undefined Params
Value Errors
Forensics
GO
GO
Select the Tool
--------------- Objects Filters ---------------
Objects marked with Don't check flows but suppose to check flows according to file type
Objects marked with check flows but do not suppose to check flows according to file type
Objects marked as non-referer but its file type marked as referer
Objects marked as referer but its file type marked as non-referer
Objects that marked with check flows but doesn't have leading flows
Objects allowed to modify domain cookies
Objects with defined dynamic parameters
Objects with dynamic flows
-------------- Flows Filters ---------------
Flows with frame target 0
Flows on given frame target which the target object is referrer
Flows marked as allow QS/PS but don't check QS/PD
Flows marked as allow QS/PS but no parameter are defined
POST flows marked as don't allow QS/PD
Flows with a given number of parameter defined on them
-------------- Parameters Filters --------------
Parameters marked as don't check value
Parameters defined as dynamic
User-input parameters with at least 1 allowed regular expression
User-input parameters with at least 1 allowed meta char
User-input parameters defined as numeric (integer/float)
Parameters with 0 length
Show all flows of a given parameter

# Chapter 7 Monitoring

Monitoring tools allow the network and policy administrators to monitor request traffic. This chapter explains how to use the TrafficShield security application monitoring tools to follow up on potential attacks and workload.

## General

The monitoring tools described in this chapter are designed to help network and policy administrators examine both legal and potentially malicious traffic. The data collected by the Monitoring module helps you identify overloaded units and make the necessary decisions on needed deployment changes.

All of the events tracked in Monitoring can also be captured in SNMP traps and exported to Syslog files. In addition, all the reports generated can be exported as HTML or PDF files. Contact your F5 Networks account representative for more details on these features.

To access the monitoring functions, click the Monitoring tab at the top of the TrafficShield security application.

This tool is divided into four areas which are explained in detail in this chapter:

> ***System Monitoring*** This area monitors the TrafficShield security application units and their system status, for example; whether the unit is active or in standby mode. System logs can also be monitored from here.
>
> ***Security Monitoring*** This area monitors the ongoing security statuses and events

that occur on the TrafficShield security application units.

***Reports*** This area generates reports and graphs on the ongoing attacks that have occurred on the TrafficShield security application units.

***User Monitoring*** This area monitors the authorized users' activities on the TrafficShield security application units.

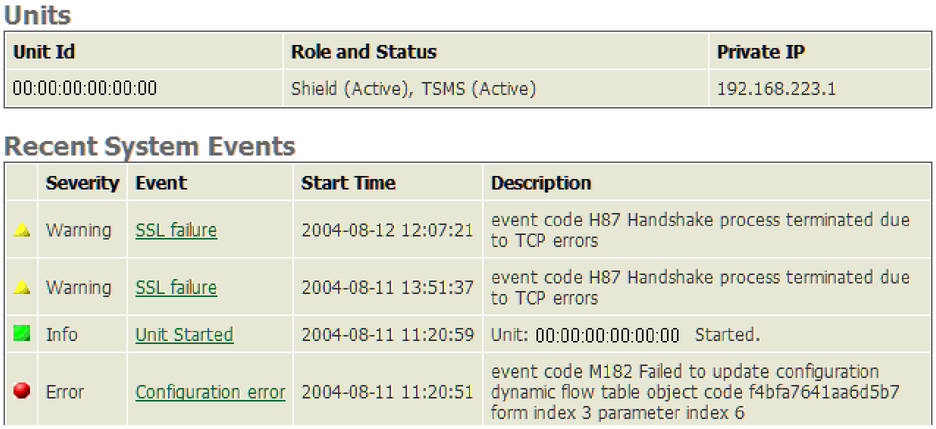
The filtering tools allow you to retrieve and focus on a set of events of particular interest to you. For example, you can focus on events that took place in the last hour, or events that involve requests that contained a specific text string.

TrafficShield security application provides two filtering tools: the extensive filter and the simple filter.

# System

## Status

Choose Monitoring -> System -> Status tab to open the Unit window and the Recent System Events window.



Units

| Unit Id | Role and Status | Private IP |
|---|---|---|
| 00:00:00:00:00:00 | Shield (Active), TSMS (Active) | 192.168.223.1 |

Recent System Events

| | Severity | Event | Start Time | Description |
|---|---|---|---|---|
| ▲ | Warning | SSL failure | 2004-08-12 12:07:21 | event code H87 Handshake process terminated due to TCP errors |
| ▲ | Warning | SSL failure | 2004-08-11 13:51:37 | event code H87 Handshake process terminated due to TCP errors |
| 🟩 | Info | Unit Started | 2004-08-11 11:20:59 | Unit: 00:00:00:00:00:00 Started. |
| ● | Error | Configuration error | 2004-08-11 11:20:51 | event code M182 Failed to update configuration dynamic flow table object code f4bfa7641aa6d5b7 form index 3 parameter index 6 |

## Units

This window displays the current status of all the TrafficShield Units.

### Unit Id

This is the MAC address of the relevant unit.

### Role and Status

There are three possible roles:

Shield – This module is responsible for blocking requests that violated the security definitions and alerting the user.

TSMS – TrafficShield Management Station, this module is responsible for monitoring, configuring and managing the TrafficShield components and GUI.

TSMS Backup – indicates whether the Hot Backup unit is active.

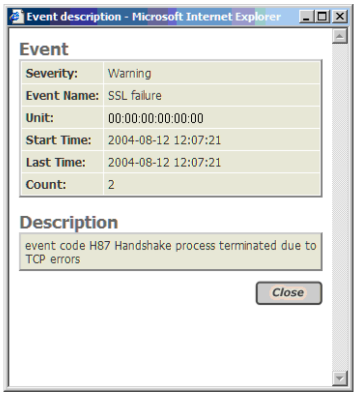
Possible statues: Active, None, Starting

### Private IP

The unique IP address assigned to the TrafficShield security application unit.

## Recent System Events

The Recent System Events section lists the latest events that took place at the operating system level in the units or in the management station. The report can also refer to operating system events posted to the system log. Clicking an event displays more information about it in the Event Description box.



Event

| | |
|---|---|
| Severity: | Warning |
| Event Name: | SSL failure |
| Unit: | 00:00:00:00:00:00 |
| Start Time: | 2004-08-12 12:07:21 |
| Last Time: | 2004-08-12 12:07:21 |
| Count: | 2 |

Description

event code H87 Handshake process terminated due to TCP errors

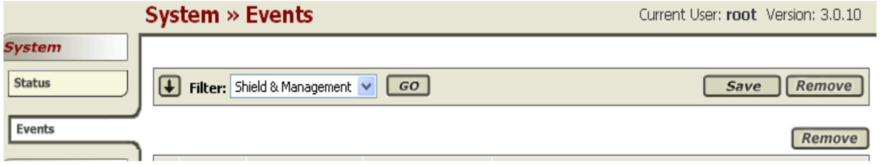
The Start Time and Last Time fields indicate the first and last time that this event occurred. The Count Field shows the number of times this event took place between the indicated times.

You can display the same report by selecting the Events tab in the System menu. This display includes a filtering tool that allows you to focus on certain events.

## Events

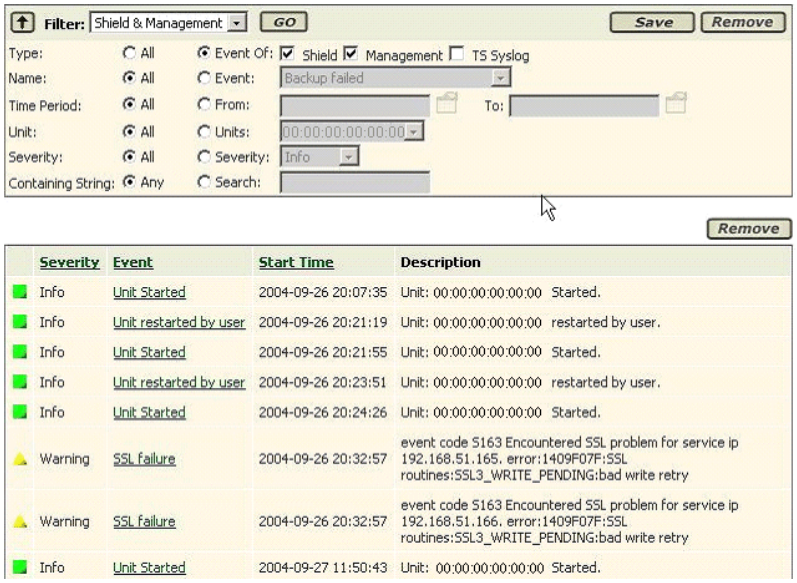
This window is very similar to the System Status window, but instead of displaying the status of the TrafficShield security application's units, an advanced filter window is available.

1. Open the filtering tool by clicking the down-arrow icon displayed on the Filter row (you can close it by clicking the button again).



System » Events

Current User: root Version: 3.0.10



Type: ○ All ● Event Of: ☑ Shield ☑ Management □ TS Syslog
Name: ● All ○ Event: Backup failed
Time Period: ● All ○ From: To:
Unit: ● All ○ Units: 00:00:00:00:00:00
Severity: ● All ○ Severity: Info
Containing String: ● Any ○ Search:

| | Severity | Event | Start Time | Description |
|---|---|---|---|---|
| 🟩 | Info | Unit Started | 2004-09-26 20:07:35 | Unit: 00:00:00:00:00:00 Started. |
| 🟩 | Info | Unit restarted by user | 2004-09-26 20:21:19 | Unit: 00:00:00:00:00:00 restarted by user. |
| 🟩 | Info | Unit Started | 2004-09-26 20:21:55 | Unit: 00:00:00:00:00:00 Started. |
| 🟩 | Info | Unit restarted by user | 2004-09-26 20:23:51 | Unit: 00:00:00:00:00:00 restarted by user. |
| 🟩 | Info | Unit Started | 2004-09-26 20:24:26 | Unit: 00:00:00:00:00:00 Started. |
| ⚠ | Warning | SSL failure | 2004-09-26 20:32:57 | event code 5163 Encountered SSL problem for service ip 192.168.51.165. error:1409F07F:SSL routines:SSL3_WRITE_PENDING:bad write retry |
| ⚠ | Warning | SSL failure | 2004-09-26 20:32:57 | event code 5163 Encountered SSL problem for service ip 192.168.51.166. error:1409F07F:SSL routines:SSL3_WRITE_PENDING:bad write retry |
| 🟩 | Info | Unit Started | 2004-09-27 11:50:43 | Unit: 00:00:00:00:00:00 Started. |

2. Select one or more filtering options.

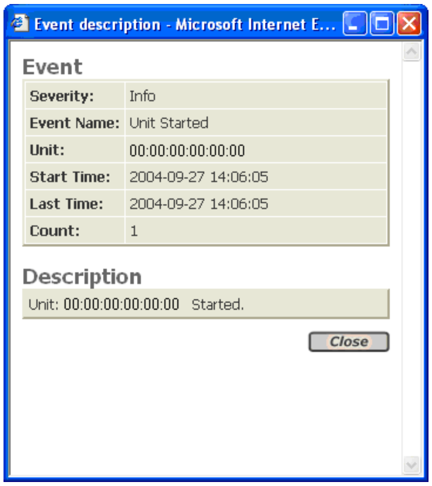
The filtering options are those that have a radio button. For example, select the Severity radio button and then select a severity level to list only events of the selected severity.

You can select multiple filtering options to further limit the scope of the retrieval. For example, setting a period in From/To and selecting a severity, lists the events of the selected severity level that took place within the specified period.

To cancel the filter in a certain category, check the *All* radio button.

| **Criteria** | **Description** |
|---|---|
| Filter | A predefined set of filtering parameters. |
| Type: Event Of | Filters the events that took place in the units, and events that have been posted to the operating system's log (system Log). Check the box that corresponds to the events you want to retrieve. You can select more than one option. |
| Name: Event | If you want to focus on a specific event, select the Event radio button and then select the event you want in the drop-down list. |
| Time Period: From/To | To retrieve events that took place in a certain period, select the From radio button. Then, use the 📅 icon in the From/To fields to select the start date/time and end date/time of the period. Note that you can select the time by clicking the time fields at the bottom of the calendar box. |
| Unit Units | If you want to focus on events that took place in a certain unit, select the Units radio button and then select the unit's ID. |
| Severity: Severity | To retrieve only events of a certain severity level, select the Severity radio button and then select a level from the drop-down list. |
| Containing String: Search | Use this option to pinpoint events whose message contains a certain text. Select the Search radio button and type the text. |

3. To display more information about the event, click the event link. This displays a description of the event.



Event

| | |
|---|---|
| Severity: | Info |
| Event Name: | Unit Started |
| Unit: | 00:00:00:00:00:00 |
| Start Time: | 2004-09-27 14:06:05 |
| Last Time: | 2004-09-27 14:06:05 |
| Count: | 1 |

Description

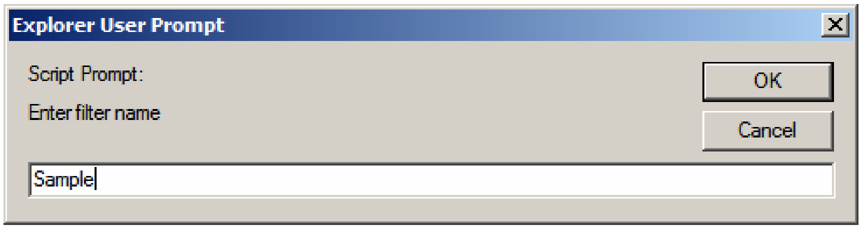
Unit: 00:00:00:00:00:00 Started.

4. When you have read the even summary, click the Close button.

5. On the Events screen, click the Go button to activate the filter.

6. Click the Save button, after selecting the retrieval criteria, so you can re-use it whenever you want.

   This opens the following window.



Script Prompt:

Enter filter name

Sample

   Type a name for the selected criteria and click OK.

7. You can delete a criteria definition by selecting it in the Filter list and clicking the Remove button.

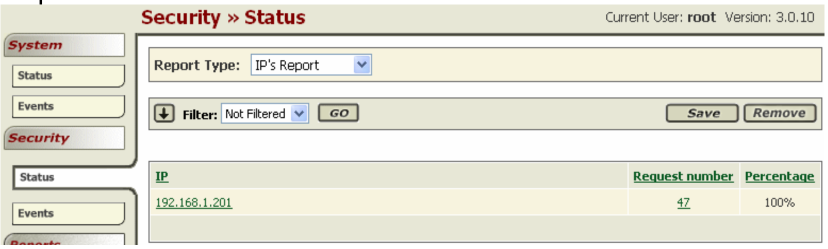
# Security

## Status

The Status tab in the Security menu shows a list of security violations that have occurred. There are two report types available:

- In Report Type, select Violation Report, to display a list of violations.
- In Report Type select IP Report, to display the IP addresses that committed the violations.

Both reports display the number of requests and the percentage of those requests that occurred from the total requests.



Report Type: IP's Report

Filter: Not Filtered

| IP | Request number | Percentage |
|---|---|---|
| 192.168.1.201 | 47 | 100% |

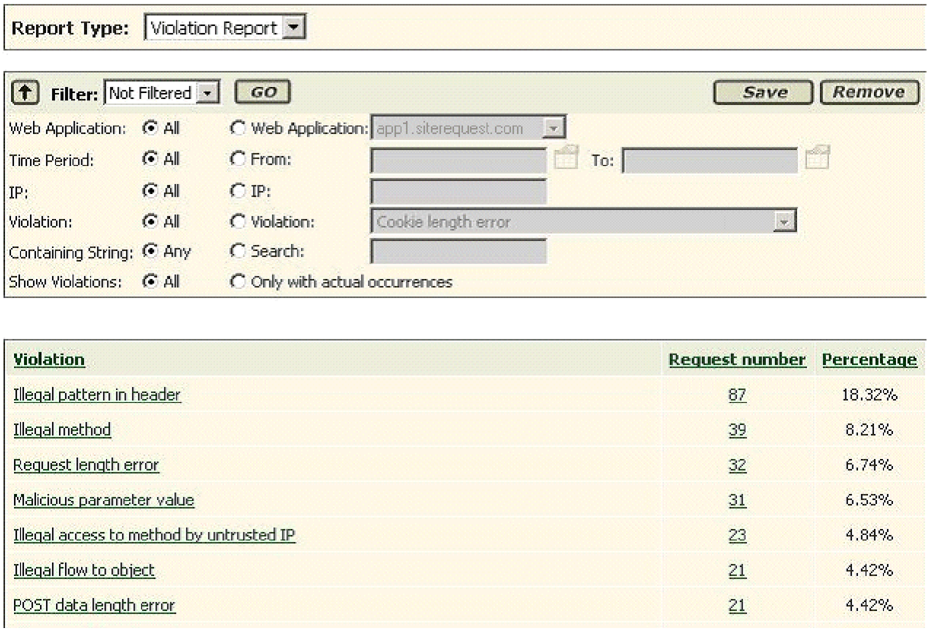
*To define the filter criteria:*

1. Open the filtering tool by clicking the down-arrow icon displayed on the Filter row (you can close it by clicking the button again).
2. Use the *Go* button to update the violation display using the latest filter criteria.
3. Use the Save button to save the changes made to the filter criteria, thus creating a customized filter.
4. Use the Remove button to remove customized filters.

**Note**

It is not possible to delete the built in filters.

5. The filter criteria are displayed in the top part of the window while the filtered violation list is displayed in the bottom part of the window.



Report Type: Violation Report

Filter: Not Filtered

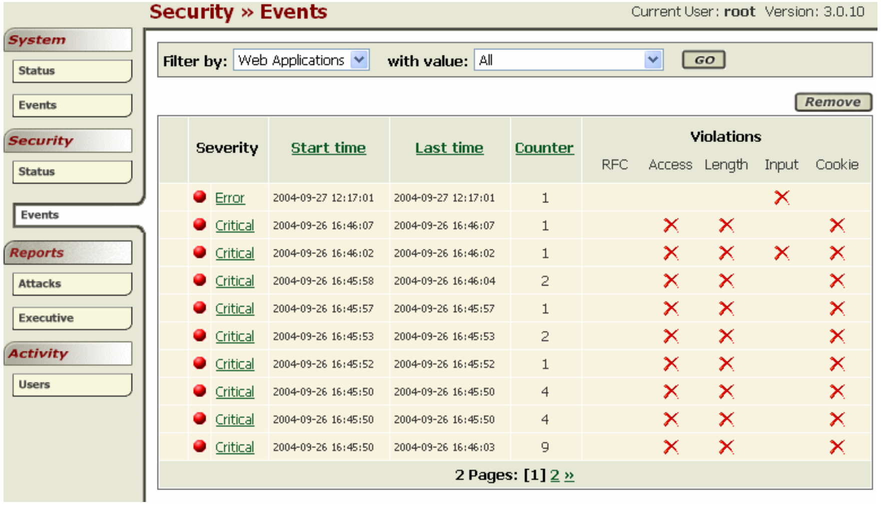
| | | |
|---|---|---|
| Web Application: | ● All | ○ Web Application: app1.siterequest.com |
| Time Period: | ● All | ○ From: To: |
| IP: | ● All | ○ IP: |
| Violation: | ● All | ○ Violation: Cookie length error |
| Containing String: | ● Any | ○ Search: |
| Show Violations: | ● All | ○ Only with actual occurrences |

| Violation | Request number | Percentage |
|---|---|---|
| Illegal pattern in header | 87 | 18.32% |
| Illegal method | 39 | 8.21% |
| Request length error | 32 | 6.74% |
| Malicious parameter value | 31 | 6.53% |
| Illegal access to method by untrusted IP | 23 | 4.84% |
| Illegal flow to object | 21 | 4.42% |
| POST data length error | 21 | 4.42% |

| **Criteria** | **Description** |
|---|---|
| Filter | A predefined set of filtering parameters |
| Web Application | To focus on events relating to one of the protected Web applications, select the Web Application radio button and then select the Web application from the drop-down list. |
| Time Period: From/To | To retrieve events that took place in a certain period, select the From radio button. Then, use the 📅 icon in the From/To fields to select the start date/time and end date/time of the period. Note that you can select the time by clicking the time fields at the bottom of the calendar box. |
| IP | To retrieve events originating from an IP address, select the IP radio button and then enter the address in the adjacent box. |
| Violation | To list the events that were registered as a result of a specific attack type, select the Violation radio button and then select the standard attack name from the drop-down list. |
| Containing String: Search | Use this option to pinpoint events whose message contains a certain text. Select the Search radio button and type the text. |

# Events

The Security-Events tab lists the events relating to requests that do not comply with the blocking parameters. For example, you can see a list of events relating to requests that committed a length or a cookie violation.



**Security » Events**

Current User: **root** Version: 3.0.10

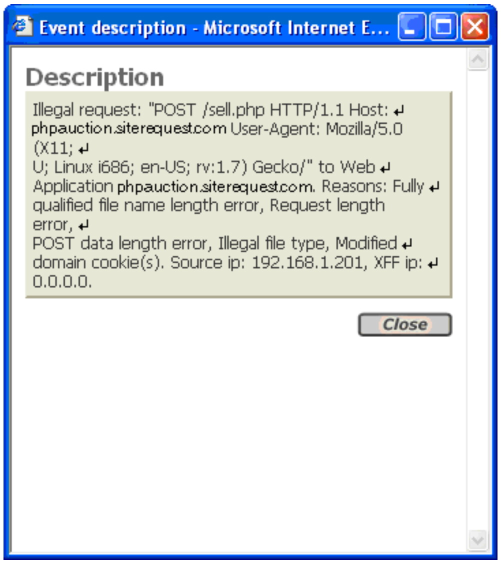
Filter by: Web Applications with value: All

| | Severity | Start time | Last time | Counter | Violations | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | RFC | Access | Length | Input | Cookie |
| ● | Error | 2004-09-27 12:17:01 | 2004-09-27 12:17:01 | 1 | | | | ✕ | |
| ● | Critical | 2004-09-26 16:46:07 | 2004-09-26 16:46:07 | 1 | | ✕ | ✕ | | ✕ |
| ● | Critical | 2004-09-26 16:46:02 | 2004-09-26 16:46:02 | 1 | | ✕ | ✕ | ✕ | ✕ |
| ● | Critical | 2004-09-26 16:45:58 | 2004-09-26 16:46:04 | 2 | | ✕ | ✕ | | ✕ |
| ● | Critical | 2004-09-26 16:45:57 | 2004-09-26 16:45:57 | 1 | | ✕ | ✕ | | ✕ |
| ● | Critical | 2004-09-26 16:45:53 | 2004-09-26 16:45:53 | 2 | | ✕ | ✕ | | ✕ |
| ● | Critical | 2004-09-26 16:45:52 | 2004-09-26 16:45:52 | 1 | | ✕ | ✕ | | ✕ |
| ● | Critical | 2004-09-26 16:45:50 | 2004-09-26 16:45:50 | 4 | | ✕ | ✕ | | ✕ |
| ● | Critical | 2004-09-26 16:45:50 | 2004-09-26 16:45:50 | 4 | | ✕ | ✕ | | ✕ |
| ● | Critical | 2004-09-26 16:45:50 | 2004-09-26 16:46:03 | 9 | | ✕ | ✕ | | ✕ |

2 Pages: [1] 2 »

Events that have been blocked are marked with the ✋ ("stop") icon.

To display more information about the event, click the severity link. This displays a description of the event.



Description

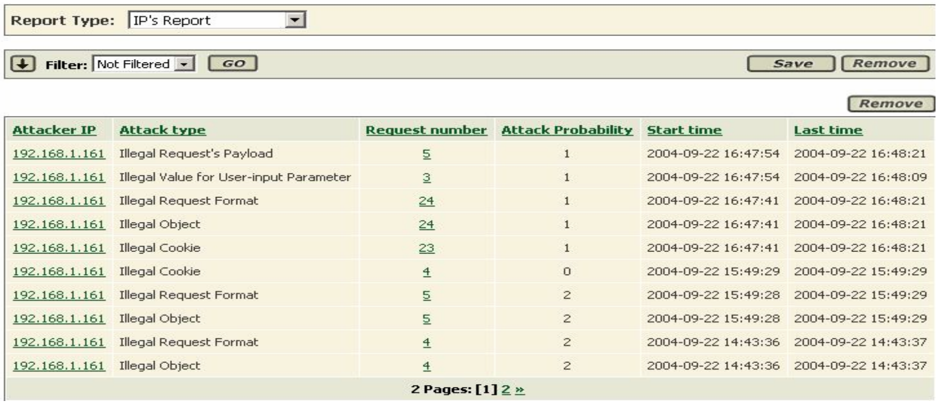
Illegal request: "POST /sell.php HTTP/1.1 Host: ↵
phpauction.siterequest.com User-Agent: Mozilla/5.0
(X11; ↵
U; Linux i686; en-US; rv:1.7) Gecko/" to Web ↵
Application phpauction.siterequest.com. Reasons: Fully ↵
qualified file name length error, Request length
error, ↵
POST data length error, Illegal file type, Modified ↵
domain cookie(s). Source ip: 192.168.1.201, XFF ip: ↵
0.0.0.0.

# Reports

## Attacks

This report provides a more global view on a number of illegal requests of a given type.

When sent at a high frequency, these illegal requests are considered as a clear intention to cause a specific damage. For example, the TrafficShield security application detects such attack types as "buffer overflow,” "parameter value tempering,” "forceful browsing," and more. The Reports-Attacks tab puts together such sets of illegal requests.



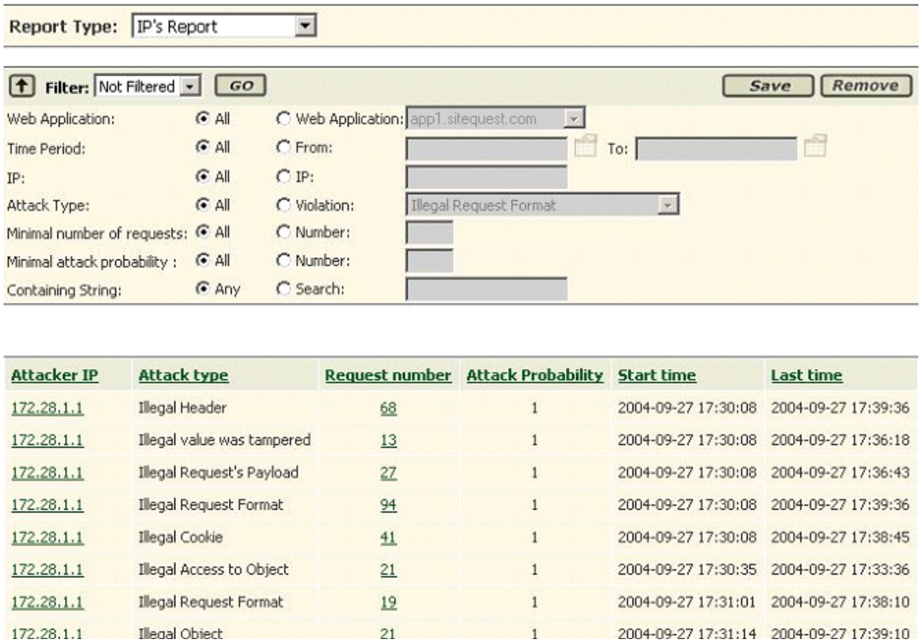
Report Type: IP's Report

Filter: Not Filtered

| Attacker IP | Attack type | Request number | Attack Probability | Start time | Last time |
|---|---|---|---|---|---|
| 192.168.1.161 | Illegal Request's Payload | 5 | 1 | 2004-09-22 16:47:54 | 2004-09-22 16:48:21 |
| 192.168.1.161 | Illegal Value for User-input Parameter | 3 | 1 | 2004-09-22 16:47:54 | 2004-09-22 16:48:09 |
| 192.168.1.161 | Illegal Request Format | 24 | 1 | 2004-09-22 16:47:41 | 2004-09-22 16:48:21 |
| 192.168.1.161 | Illegal Object | 24 | 1 | 2004-09-22 16:47:41 | 2004-09-22 16:48:21 |
| 192.168.1.161 | Illegal Cookie | 23 | 1 | 2004-09-22 16:47:41 | 2004-09-22 16:48:21 |
| 192.168.1.161 | Illegal Cookie | 4 | 0 | 2004-09-22 15:49:29 | 2004-09-22 15:49:29 |
| 192.168.1.161 | Illegal Request Format | 5 | 2 | 2004-09-22 15:49:28 | 2004-09-22 15:49:29 |
| 192.168.1.161 | Illegal Object | 5 | 2 | 2004-09-22 15:49:28 | 2004-09-22 15:49:29 |
| 192.168.1.161 | Illegal Request Format | 4 | 2 | 2004-09-22 14:43:36 | 2004-09-22 14:43:37 |
| 192.168.1.161 | Illegal Object | 4 | 2 | 2004-09-22 14:43:36 | 2004-09-22 14:43:37 |

2 Pages: [1] 2 »

1. Open the filtering tool by clicking the down-arrow icon displayed on the Filter row (you can close it by clicking the button again).



Report Type: IP's Report

Filter: Not Filtered

Web Application: ● All ○ Web Application: app1.sitequest.com

Time Period: ● All ○ From: To:

IP: ● All ○ IP:

Attack Type: ● All ○ Violation: Illegal Request Format

Minimal number of requests: ● All ○ Number:

Minimal attack probability : ● All ○ Number:

Containing String: ● Any ○ Search:

| Attacker IP | Attack type | Request number | Attack Probability | Start time | Last time |
|---|---|---|---|---|---|
| 172.28.1.1 | Illegal Header | 68 | 1 | 2004-09-27 17:30:08 | 2004-09-27 17:39:36 |
| 172.28.1.1 | Illegal value was tampered | 13 | 1 | 2004-09-27 17:30:08 | 2004-09-27 17:36:18 |
| 172.28.1.1 | Illegal Request's Payload | 27 | 1 | 2004-09-27 17:30:08 | 2004-09-27 17:36:43 |
| 172.28.1.1 | Illegal Request Format | 94 | 1 | 2004-09-27 17:30:08 | 2004-09-27 17:39:36 |
| 172.28.1.1 | Illegal Cookie | 41 | 1 | 2004-09-27 17:30:08 | 2004-09-27 17:38:45 |
| 172.28.1.1 | Illegal Access to Object | 21 | 1 | 2004-09-27 17:30:35 | 2004-09-27 17:33:36 |
| 172.28.1.1 | Illegal Request Format | 19 | 1 | 2004-09-27 17:31:01 | 2004-09-27 17:38:10 |
| 172.28.1.1 | Illegal Object | 21 | 1 | 2004-09-27 17:31:14 | 2004-09-27 17:39:10 |

2. Use the *Go* button to update the attack display using the latest filter criteria.

3. Use the *Save* button to save the changes made to the filter criteria, thus creating a customized filter.

4. Use the *Remove* button to remove customized filters.

The columns displayed are:

### Request Number

The Request Number column indicates the number of requests of the specific attack type. Click a number to display the requests.

### Attack Probability

The TrafficShield security application calculates and suggests a probability that the certain set of requests already launched an attack.

### Start Time

This is the first time this attack was noted.

### Last Time

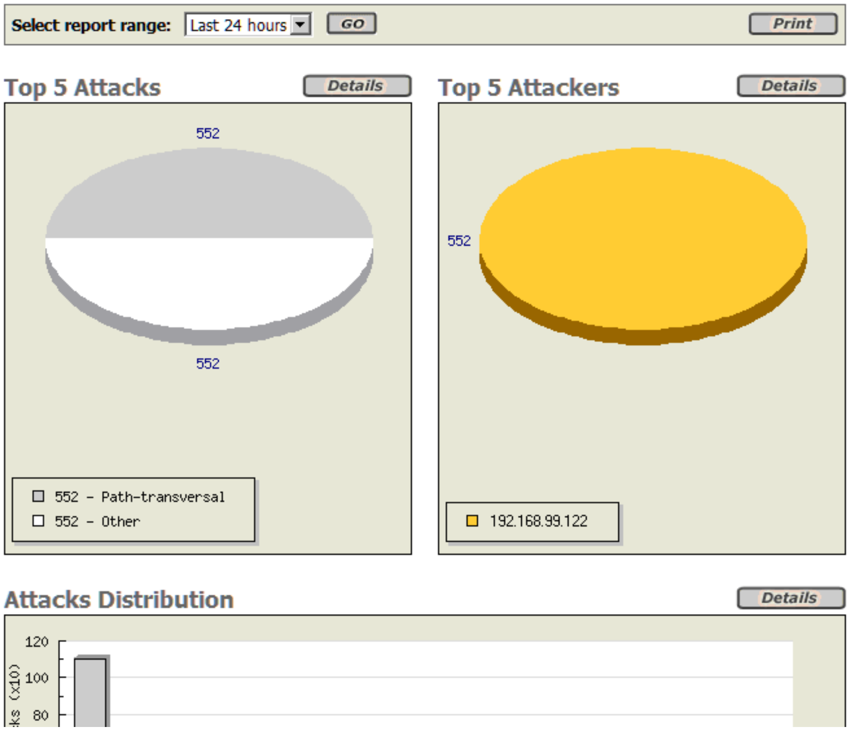
This is the last time this attack was noted.

The options in the Report Type section are as follows:

| Criteria | Description |
|---|---|
| Filter | A predefined set of filtering parameters |
| Web Application | To focus on events relating to one of the protected Web applications, select the Web Application radio button and then select the Web application from the drop-down list. |
| Time Period-From/To | To retrieve events that took place in a certain period, select the Form radio button. Then, use the 📅 icon in the From/To fields to select the start date/time and end date/time of the period. Note that you can select the time by clicking the time fields at the bottom of the calendar box. |
| IP | To retrieve events originating from an IP address, select the IP radio button and then enter the address in the adjacent box. |
| Attack Type | Select an attack type. This applies, especially, to the Attacks Report that groups together requests that have the characteristics of a standard attack type. You can use it in conjunction with "Minimal number of requests". |
| Minimal number of requests | Use this parameter to list attacks that included at least a specified number of requests that characterize standard attack types. |
| Minimal attack probability | This is a sorting option that displays the attacks from  the lowest probability. |
| Containing String | Use this option to pinpoint events whose message contains a certain text. Select the Search radio button and type the text. |

## Executive

The report is displayed by selecting the Reports-> Executive tab. It graphically displays the attack statistics.



This report contains the same type of information as in the Attacks report, only it retrieves the five most frequent attacks or attackers (IP). The *Details* button functions like the links in the Attacks report, listing attacks or IP addresses.

The Attacks Distribution section displays the attack types over time. The Details button displays the same information in textual format.

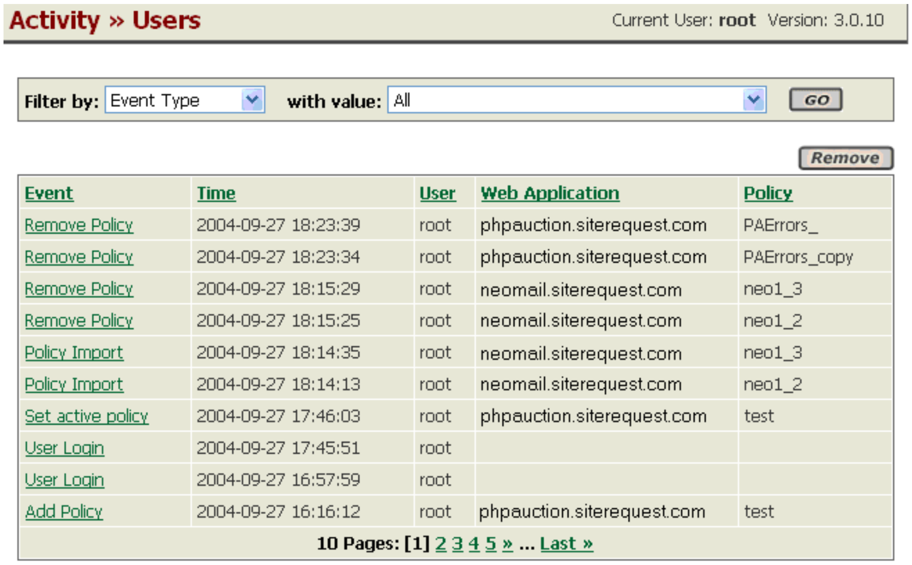
# Activity

## Users

User activity consists of such operations as logging on to TSMS or adding a new policy. You can use the monitoring tool to examine the user activities that took place in the system.

*To monitor user activities:*

1. On the top menu, click the Monitoring button.
2. In the Activity section of the navigation pane, select the Users tab.



Activity » Users

Current User: **root** Version: 3.0.10

**Filter by:** Event Type **with value:** All

| Event | Time | User | Web Application | Policy |
|---|---|---|---|---|
| Remove Policy | 2004-09-27 18:23:39 | root | phpauction.siterequest.com | PAErrors_ |
| Remove Policy | 2004-09-27 18:23:34 | root | phpauction.siterequest.com | PAErrors_copy |
| Remove Policy | 2004-09-27 18:15:29 | root | neomail.siterequest.com | neo1_3 |
| Remove Policy | 2004-09-27 18:15:25 | root | neomail.siterequest.com | neo1_2 |
| Policy Import | 2004-09-27 18:14:35 | root | neomail.siterequest.com | neo1_3 |
| Policy Import | 2004-09-27 18:14:13 | root | neomail.siterequest.com | neo1_2 |
| Set active policy | 2004-09-27 17:46:03 | root | phpauction.siterequest.com | test |
| User Login | 2004-09-27 17:45:51 | root | | |
| User Login | 2004-09-27 16:57:59 | root | | |
| Add Policy | 2004-09-27 16:16:12 | root | phpauction.siterequest.com | test |

**10 Pages: [1] 2 3 4 5 » ... Last »**

3. In Filter By – By Value you select the events to display.

   For example, in Filter By select Policy and in With Value select the name of a policy, and click the Show button to list the user activities that took place in relation with the indicated policy. Another example: Select Duration-Last Hour returns events posted in the last 60 minutes.

The *Remove* button deletes all of the listed events. To list the events that meet the criteria, click the *Go* button.

# Appendix A Glossary

**Term** **Description**

**ARP**

Address Request Protocol: (a networking protocol). A method for finding a host's IP address from its Ethernet address. The sender broadcasts an ARP packet containing the IP address of another host and waits for it (or some other host) to send back its Ethernet address. Each host maintains a cache of address translations to reduce delay and loading. ARP allows the IP address to be independent of the Ethernet address, but it only works if all hosts support it.

ARP is defined in RFC 826.

The alternative for hosts that do not do ARP is constant mapping.

**Check Object**

Indicates whether TrafficShield security application should check the Object requested in the HTTP/HTTPS request against the list of its known objects before it forwards the request to the server. In case it doesn’t find the requested object in the list, it generates a violation that, based on the blocking policy, can cause the request to be blocked

| Term | Description |
|---|---|
| **Cookie** | A packet of information sent by an HTTP server to a World-Wide Web browser and then sent back by the browser each time it accesses that server. Cookies can contain any arbitrary information the server chooses and are used to maintain state between otherwise stateless HTTP transactions. Typically this is used to authenticate or identify a registered user of a Web application without requiring them to sign in again every time they access that Web application. Other uses are maintaining a "shopping basket" of goods you have selected to purchase during a session at a Web application, Web application personalization (presenting different pages to different users), and tracking a particular user's access to a Web application. |
| **DELETE** | An HTTP request type that requests to delete a resource on the web server. |
| **Domain Name** | A series of alphanumeric strings separated by periods, such as www.siterequest.com, that is an address of a computer network connection, and that identifies the owner of the address. |
| **Dynamic Parameter.** | A dynamic parameter is a parameter in a request where the set of legal values this parameter can have is changing dynamically, and usually depends of the user session. For example, in a banking application the account number is a dynamic parameter, since each user has its own set of legal account numbers that this parameter can have. This set of legal account numbers is dynamically generated by the server and embedded in the web page sent to user. TrafficShield security application extracts this list of legal values from the web page that is sent to the user, and uses them to verify that the value sent in the request for the dynamic parameter is legal. |
| **Dynamic Value** | See dynamic parameter |

| Term | Description |
|---|---|
| **Entry Point** | A web page that could be the first requested page in the Web application: an end-user could get to the  Entry Point by typing a URL in the browser window, opening a favorites menu, be linked from a different Web application or e-mail client. The end user could also get to the Entry Point by clicking a back button of the browser. |
| **Flow** | The defined access path for a browser to get from one object to another specific object. |
| **GET** | A type of HTTP request that does not have a content body |
| **Learning** | A process of making a policy more accurate by verifying how the policy complies with the traffic requests, and if there are discrepancies between the policy and the traffic requests, then translating these discrepancies into a suggestion for modifying the policy. The learning phase also enables the system administrator to verify that the policy is not generating any false positives before turning on the blocking feature. The learning process can be used to fine-tune any policy component such as requests length, parameters, and values. In case new objects are added in the Web application, TrafficShield security application can learn those objects and their flows using the learning engine. |
| **Length-Cookie** | The length of the cookie. |
| **Length-Post Data** | The length of the Data that comes with a POST request. |
| **Length-Query String** | The length of the Query string. |
| **Length-Request** | See Request Length. |
| **Length-URI** | The length of the URI in characters. |
| **Meta-character** | A character or a sequence of characters that has a special meaning (<SCRIPT>, \ , SELECT, INSERT, ; ,`, <). |

**Term** **Description**

**Method** The HTTP/HTTPS request method, e.g. GET, POST, HEAD, PUT, and DELETE.

**Object** A file or a script that generates web pages on the web server that can be requested by a user,

**Object is Allowed to modify domain Cookie** In case an Object (i.e., a web page) includes a JavaScript/java applet/flash as part of the client-side and can change a domain cookie value, the object should by defined as "Object is allowed to modify Cookie."

**Path Traversal** An HTTP Attack that uses patterns like ../../ to get access to files not intended to viewed above the WWW root, or in order to cross directories on the server.

**Policy** A set of rules that enables TrafficShield security application to understand if a request is valid.

**POST** A type of HTTP request, in which a query is put into a content body and possibly compressed or encoded.

**PUT** An HTTP request type that requests a content change on the web server.

**Query String** Part of an HTTP request that specifies a list of parameters and values into a CGI script. For instance:

http://www.siterequest.com/index.cgi?param1=value1&param2=value2

Anything that comes after the question mark in the example above is a query string.

**Referrer** A web page that requests other objects An HTML page could request picture files and other html objects to be downloaded, but pictures cannot cause other objects to be downloaded. For example, HTML, asp, php pages are usually Referrers, while gif and jpeg images are not.

| Term | Description |
|---|---|
| **Regular Expression** | Used by UNIX utilities such as grep, sed and awk, and by editors such as vi and Emacs. A regular expression (regexp) is a sequence of characters which provides the user with a powerful, flexible and efficient test processing tool.<br>For more details on how to write regular expressions please refer to the many books written on this subject; for example: Mastering Regular Expressions, by Jeffrey E.F. Frieldl, Published by O'Reilly & Associates, Inc. |
| **Request Length** | The total Length of the HTTP request (in characters) which includes the request line, all headers, cookies, and post data. |
| **Server IP** | The IP address of the Web Server that TrafficShield security application is protecting (usually this is an internal IP address). |
| **Service IP** | The external IP address on which TrafficShield security application is listening for http requests. (Usually this is the IP address that the DNS A record of the Web Server is mapped to.) |
| **Shield Unit** | The on-line enforcing mechanism responsible for TCP session termination, requests parsing, and analyzing. |
| **Static Parameter** | A parameter in the request where its values are chosen from a known set of values: Name of a Country, Yes/No, etc. |
| **Static Value** | See static parameter. |
| **Target Frame** | The frame to which the object is loaded. |
| **Undefined Flow** | The flow did not match the defined flows. |
| **Undefined Object** | The object did not match any objects on the list of allowed objects. |
| **URI** | Part of the URL that specifies the name of the object requested: in http://www.siterequest.com/index.hml, index.html is the URI. |

# Index