Subscription-Based Cisco IOS Content Filtering

First Published: April 18, 2008
Last Updated: December 21, 2009

The Subscription-based Cisco IOS Content Filtering feature interacts with the Trend Micro URL filtering service so that HTTP requests can be allowed or blocked, and logged, based on a content filtering policy. The content filtering policy specifies how to handle items such as web categories, reputations (or security ratings), trusted domains, untrusted domains, and keywords. URLs are cached on the router, so that subsequent requests for the same URL do not require a lookup request, thus improving performance.

Support for third-party URL filtering servers SmartFilter (previously N2H2) and Websense, which was introduced with Cisco IOS Release 12.2(11)YU and integrated into Cisco IOS Release 12.2(15)T, continues to be available.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "Feature Information for Subscription-Based Cisco IOS Content Filtering" section on page 24.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Contents

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Prerequisites for Subscription-Based Cisco IOS Content Filtering

Cisco IOS Firewalls and Zone-Based Policy Firewall

You should have an understanding of how to configure Cisco IOS firewalls and understand the concepts of traffic filtering, traffic inspection, and zone-based policy.

Trend Micro Requirements

Before you can configure the Subscription-Based Cisco IOS Content Filtering feature on the router, you must:

- Purchase the Cisco IOS Content Filtering Subscription Service from Cisco.
- Receive the Product Authorization Key (PAK) in the mail.
- Activate your license at www.cisco.com/go/license. You will need the serial number for the router and the PAK.
- Download and install the security certificate as described here:

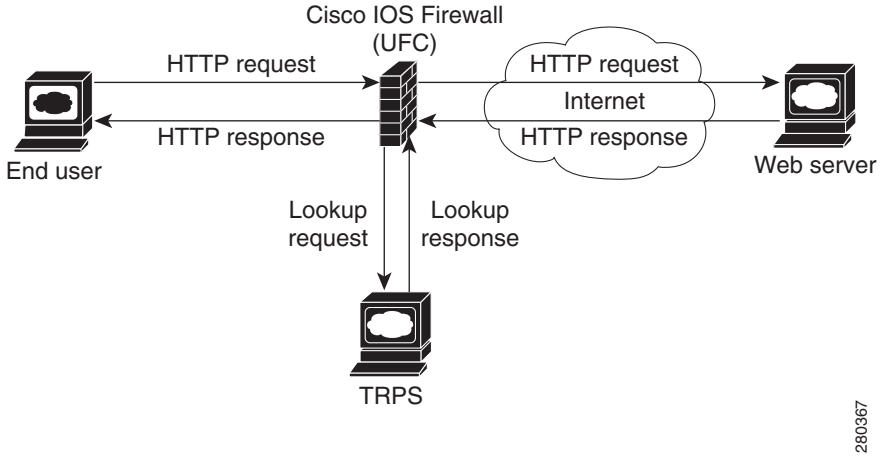
  Install Trusted Authority Certificates on Cisco IOS Routers for Trend URL Filtering Support
- Use the **trm register** command in privileged EXEC mode to register the router with the Trend Router Provisioning Server (TRPS).

Information About Subscription-Based Cisco IOS Content Filtering

Overview of Subscription-Based Cisco IOS Content Filtering

The Subscription-Based Cisco IOS Content Filtering service interacts with the Trend Micro filtering service URL requests based on URL filtering policy. Figure 1 and the following steps provide a brief overview of Cisco IOS content filtering.

Figure 1 Subscription-Based Cisco IOS Content Filtering Sample Topology



1. The end user opens a web browser and browses to a web page.
2. The browser sends an HTTP request to the Cisco IOS content filtering service.
3. The Cisco IOS content filtering service receives the request, forwards the request to the web server while simultaneously extracting the URL and sending a lookup request to the TRPS.
4. The TRPS receives the lookup request and retrieves the URL category for the requested URL from its database.
5. The TRPS sends the lookup response to the Cisco IOS content filtering service.
6. The Cisco IOS content filtering service receives the lookup response and permits or denies the URL as specified by a Trend Micro URL filtering policy on the router.
7. The Cisco IOS content filtering service caches the URL and lookup response.

Overview of URL Filtering Policies

A URL filtering policy contains an association of classes and actions and a set of URL filtering parameters that specify how the system handles URL requests.

- A class is a set of match criteria that identifies traffic based on its content. Classes are specified by class maps.
- An action is a specific function associated with a given traffic class. For URL traffic, the actions include **allow**, **log**, and **reset**.
- Classes and actions are associated with one another in a policy map.
- URL filtering parameters specify information about the URL filtering server. URL filtering parameters are specified in a parameter map.
- A URL filtering policy goes into effect when it is attached to a zone pair with the service-policy command.
- You can configure multiple URL filtering policies on the system.

Cisco IOS Content Filtering Modes

Subscription-based Cisco IOS content filtering operates in one of three modes: local filtering mode, URL database filtering mode, and allow mode.

Local Filtering Mode

In this mode, the Cisco IOS content filtering service first tries to match the requested URL with the local lists of trusted domains (white list), untrusted domains (black list), and blocked keywords. If a match is not found, the Cisco IOS content filtering service forwards the lookup request to the URL filtering server as specified in the policy. If the Cisco IOS content filtering service cannot establish communication with the URL filtering server, the system enters allow mode.

The system is in local filtering mode when a URL filtering policy for a URL filtering server has not been specified and when the system cannot establish a connection with the URL filtering server.

URL Database Filtering Mode

In this mode, the Cisco IOS content filtering service has connectivity with the URL filtering server; it can send URL lookup requests to and receive URL lookup responses from the URL filtering server.

In the case of a TRPS, the Cisco IOS content filtering service sends a URL category lookup request to the TRPS and the TRPS responds with the URL category and the URL reputation. Based on the policy set for the URL category and reputation, the HTTP request is allowed, denied, or logged. If a policy has not been configured for the URL category or reputation, the default is to permit the HTTP response.

In the case of SmartFilter and Websense servers, the Cisco IOS content filtering service sends a URL lookup request to the URL database server and the server responds with either a permit or deny message. URL filtering policies for SmartFilter and Websense servers specify a server-based action.

Allow Mode

When the Cisco IOS content filtering service is unable to communicate with the URL filtering server, the system enters allow mode. The default setting for allow mode is off, and all HTTP requests that pass through local filtering mode are blocked. When allow mode is on, all HTTP requests that passed through local filtering mode are allowed.

When both local filtering and URL database filtering modes fail, the system goes into allow mode. If the allow mode action is set to on, all URL requests are allowed. Otherwise, all HTTP requests are blocked.

Benefits of Subscription-Based Cisco IOS Content Filtering

The Subscription-Based Cisco IOS Content Filtering feature allows you to control web traffic based on a particular policy. This following sections describe available with this feature:

- White Lists, Black Lists, and Blocked Keyword Lists
- Caching Recent Requests
- Packet Buffering

White Lists, Black Lists, and Blocked Keyword Lists

This function, which supports the local filtering mode, provides a means of specifying per-policy lists of trusted domain names (white lists), untrusted domain names (black lists), and URL keywords to be blocked (blocked keywords).

When the domain name in a URL request matches an item on the white list, the Cisco IOS content filtering service sends the URL response to the end user's browser directly without sending a lookup request to the TRPS. When the domain name in a URL request matches an item on the black list, the Cisco IOS content filtering service blocks the URL response to the end user's browser. You can specify complete domain names or use the wildcard character * to specify partial domain names.

When a URL contains a keyword, the Cisco IOS content filtering service blocks the URL response directly without sending a lookup request to the URL filtering server. The content filtering service looks at the content of the URL beyond the domain name when making keyword comparisons. For example, if the keyword list contains the word "example," the URL "www.example1.com/example" matches on the keyword example, whereas the URL "www.example.com/example1' does not. You can specify complete words or use the wildcard character * to specify a word pattern.

Caching Recent Requests

This function provides a cache table that contains information about the most recently requested URLs. As a result, a subsequent request for the same URL can be handled by the system without sending a lookup request to the URL filtering server, thus keeping response time to a minimum. In the case of a Trend Micro filtering server, the cache table includes category information for the requested URL. In the case of SmartFilter and Websense filtering servers, the cache table specifies whether the requested URL is allowed or denied.

You can configure the size of the cache table and the length of time an entry remains in the cache table before it expires.

Packet Buffering

This buffering scheme allows the Cisco IOS content filtering service to store HTTP responses while waiting for the URL lookup response from the URL filtering server. The responses remain in the buffer until the response is received from the URL filtering server. If the response indicates that the URL is allowed, the content filtering service releases the HTTP response in the buffer to the end user's browser; if the status indicates that the URL is blocked, the content filtering service discards the HTTP responses in the buffer and closes the connection to both ends. This function prevents numerous HTTP responses from overwhelming your system.

You can specify the number of responses that can be held in the buffer. The default is 200.

Support for SmartFilter and Websense URL Filtering Servers

The Cisco IOS content filtering service provides support for SmartFilter and Websense URL filtering servers. In the case of these third-party URL filtering servers, you configure the URL filtering policy on the router to perform the action specified by the URL filtering server—that is, to allow or deny access to the requested URL.

How to Configure Subscription-Based Cisco IOS Content Filtering

- Configuring Class Maps for Local URL Filtering, page 6 (required)
- Configuring Class Maps for Trend Micro URL Filtering, page 8 (required)
- Configuring Parameter Maps for Trend Micro URL Filtering, page 9 (required)
- Configuring URL Filtering Policies, page 12 (required)

- Attaching a URL Filtering Policy, page 13 (required)

Configuring Class Maps for Local URL Filtering

The Cisco IOS content filtering service filters URL requests on the basis of match criteria in class maps. To enable local URL filtering, you must specify at least one class map each for trusted domains, untrusted domains, and blocked keywords. The match criteria for these class maps are specified in a parameter map, which must be configured before the class map is configured.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **parameter-map type urlf-glob** *parameter-map-name*
4. **pattern** *expression*
5. **exit**
6. Repeat Steps 3 through 5.
7. **class-map type urlfilter match-any** *class-map-name*
8. **match server-domain urlf-glob** *parameter-map-name*
9. **exit**
10. Repeat Steps 7 through 9.
11. **class-map type urlfilter match-any** *class-map-name*
12. **match url-keyword urlf-glob** *parameter-map-name*
13. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**parameter-map type urlf-glob** *parameter-map-name* **Example:** `Router(config)# parameter-map type urlf-glob trusted-domain-param`	Creates the parameter map for trusted domains and enters profile configuration mode.

	Command or Action	Purpose
Step 4	**pattern** *expression* **Example:** `Router(config-profile)# pattern www.example.com`	Specifies the matching criteria in the parameter map.
Step 5	**exit** **Example:** `Router(config-profile)# exit`	Returns to global configuration mode.
Step 6	Repeat Steps 3 through 5 twice.	Configures the remaining two parameter maps required for local URL filtering: one for untrusted domains and one for URL keywords.
Step 7	**class-map type urlfilter match-any** *class-map-name* **Example:** `Router(config)# class-map type urlfilter match-any trusted-domain-class`	Creates a URL filter class for trusted domains and enters class map configuration mode.
Step 8	**match server-domain urlf-glob** *parameter-map-name* **Example:** `Router(config-cmap)# match server-domain urlf-glob trusted-domain-param`	Configures the matching criteria for the trusted domain class map.
Step 9	**exit** **Example:** `Router(config-cmap)# exit`	Returns to global configuration mode.
Step 10	Repeat Step 7 through Step 9.	Creates and configures the class map for untrusted domains and returns to global configuration mode.
Step 11	**class-map type urlfilter match-any** *class-map-name* **Example:** `Router(config)# class-map type urlfilter match-any keyword-class`	Creates the class map for URL keywords and enters class map configuration mode.
Step 12	**match url-keyword urlf-glob** *parameter-map-name* **Example:** `Router(config-cmap)# match url-keyword urlf-glob keyword-param`	Configures the match criteria for the URL keyword class map based on the previously configured parameter map.
Step 13	**exit** **Example:** `Router(config-cmap)# exit`	Returns to global configuration mode.

Configuring Class Maps for Trend Micro URL Filtering

To enable Trend Micro URL filtering, you must configure one or more class maps that specify the match criteria for URL categories. As an option, you can configure one or more class match that specify match criteria for URL reputations.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **class-map type urlfilter trend** [**match-any**] *class-map-name*
4. **match url category** *category-name*
5. Repeat Step 4 until all categories for the class map have been specified.
6. **exit**
7. Repeat Steps 3 through 6.
8. **class-map type urlfilter trend** [**match-any**] *class-map-name*
9. **match url reputation** *reputation-name*
10. Repeat Step 9 until all reputations for the class map have been specified.
11. **exit**
12. Repeat Steps 8 through 11 until all classes for Trend Micro URL reputation filtering have been configured.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**class-map type urlfilter trend** [**match-any**] *class-map-name* **Example:** `Router(config)# class-map type urlfilter trend match-any drop-category`	Creates a class map for Trend Micro URL category filtering and enters class map configuration mode.
Step 4	**match url category** *category-name* **Example:** `Router(config-cmap)# match url category Gambling`	Specifies the matching criteria for the Trend Micro URL filtering class.

	Command or Action	Purpose
Step 5	Repeat Step 4 until all categories for the class map have been specified.	(Optional) Specifies additional matching criteria.
Step 6	**exit** **Example:** `Router(config-cmap)# exit`	Returns to global configuration mode.
Step 7	Repeat Steps 3 through 6 until all classes for Trend Micro URL category filtering have been configured.	(Optional) Configures additional classes for URL filtering.
Step 8	**class-map type urlfilter trend** [**match-any**] *class-map-name* **Example:** `Router(config)# class-map type urlfilter trend match-any drop-reputation`	(Optional) Creates a class map for Trend Micro URL reputation filtering and enters class map configuration mode.
Step 9	**match url reputation** *reputation-name* **Example:** `Router(config-cmap)# match url reputation PHISHING`	(Optional) Specifies the matching criteria for the Trend Micro URL filtering class.
Step 10	Repeat Step 9 until all reputations for the class map have been specified.	(Optional) Specifies additional matching criteria.
Step 11	**exit** **Example:** `Router(config-cmap)# exit`	Returns to global configuration mode.
Step 12	Repeat Steps 8 through 11 until all classes for Trend Micro URL reputation filtering have been configured.	(Optional) Configures additional classes for URL filtering.

Configuring Parameter Maps for Trend Micro URL Filtering

To enable Trend Micro URL filtering, you must configure the global parameters for the TRPS in a parameter map. You can configure only one global Trend Micro parameter map. As an option, you can configure per-policy TRPS parameters in a per-policy parameter map.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **parameter-map type trend-global** *parameter-map-name*
4. **server** {*server-name* | *ip-address*} [**http-port** *port-number*] [**https-port** *port-number*] [**retrans** *retransmission-count*] [**timeout** *seconds*]
5. **alert** {**on** | **off**}
6. **cache-entry-lifetime** *hours*
7. **cache-size maximum-memory** *kilobyte*

8. **exit**
9. **parameter-map type urlfpolicy trend** *parameter-map-name*
10. **allow-mode** {**on** | **off**}
11. **block-page** {**message** *string* | **redirect-url** *url*}
12. **max-request** *number-requests*
13. **max-resp-pak** *number-responses*
14. **truncate hostname**
15. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**parameter-map type trend-global** *parameter-map-name* **Example:** `Router(config)# parameter-map type trend-global global-trend param`	Creates the parameter map for global parameters for the TRPS and enters profile configuration mode.
Step 4	**server** {*server-name* | *ip-address*} [**http-port** *port-number*] [**https-port** *port-number*] [**retrans** *retransmission-count*] [**timeout** *seconds*] **Example:** `Router(config-profile)# server trps1.trendmicro.com retrans 5 timeout 200`	(Optional) Configures basic server parameters for the TRPS.
Step 5	**alert** {**on** | **off**} **Example:** `Router(config-profile)# alert on`	(Optional) Turns on or off URL-filtering server alert messages that are displayed on the console.
Step 6	**cache-entry-lifetime** *hours* **Example:** `Router(config-profile)# cache-entry-lifetime 3`	(Optional) Specifies how long, in hours, an entry remains in the cache table.
Step 7	**cache-size maximum-memory** *kilobyte* **Example:** `Router(config-profile)# cache-size maximum-memory 512`	(Optional) Configures the size of the categorization cache.

	Command or Action	Purpose
Step 8	**exit** **Example:** `Router(config)# exit`	Returns to global configuration mode.
Step 9	**parameter-map type urlfpolicy trend** *parameter-map-name* **Example:** `Router(config)# parameter-map type urlfpolicy trend trend-param-map`	(Optional) Creates a parameter map for the per-policy parameters for a Trend Micro URL filtering policy and enters profile configuration mode.
Step 10	**allow-mode** {**on** | **off**} **Example:** `Router(config-profile)# allow-mode on`	(Optional) Specifies whether to allow or block URL requests when the URL filtering process does not have connectivity to the specified URL filtering service. • When allow mode is **on**, all unmatched URL requests are allowed. • When allow mode is **off**, all unmatched URL requests are blocked. • The default is **off**.
Step 11	**block-page** {**message** *string* | **redirect-url** *url*} **Example:** `Router(config-profile)# block-page message "This page is blocked by Trend policy."`	(Optional) Specifies the response to a blocked URL request. • **message** *string*—Specifies the message text to be displayed when a URL request is blocked. • **redirect-url** *url*—Specifies the URL of the web page to be displayed when a URL request is blocked.
Step 12	**max-request** *number-requests* **Example:** `Router(config-profile)# max-request 5000`	(Optional) Specifies the maximum number of pending URL requests. • The range is from 1 to 2147483647. • The default is 1000.
Step 13	**max-resp-pak** *number-responses* **Example:** `Router(config-profile)# max-resp-pak 500`	(Optional) Specifies the number of HTTP responses that can be buffered. • The range is from 0 to 20000. • The default is 200.
Step 14	**truncate hostname** **Example:** `Router(config-profile)# truncate hostname`	(Optional) Specifies that URLs be truncated at the end of the domain name.
Step 15	**exit** **Example:** `Router(config-profile)# exit`	Returns to global configuration mode.

Configuring URL Filtering Policies

URL filtering policies are configured by associating classes with actions and specifying the URL filtering parameters for the URL filtering server. To enable subscription-based Cisco IOS content filtering, you must configure a Trend Micro URL filtering policy. To enable SmartFilter or Websense URL filtering, you must configure a SmartFilter or Websense URL filtering policy.

Prerequisites

Before you can configure a URL filter policy, you must have previously configured the URL filter classes to which the policy applies and have specified a parameter map for the filtering server.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **policy-map type inspect urlfilter** *policy-map-name*
4. **parameter type urlfpolicy** [**local** | **trend** | **n2h2** | **websense**] *parameter-map-name*
5. **class type urlfilter** [**trend** | **n2h2** | **websense**] *class-map-name*
6. **allow** | **reset** | **server-specified-action**
7. **exit**
8. Repeat Steps 4 through 8 for the remaining classes of traffic to which the policy applies.
9. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**policy-map type inspect urlfilter** *policy-map-name* **Example:** `Router(config)# policy-map type inspect urlfilter trend-policy`	Creates the policy map for the URL filtering policy and enters policy-map configuration mode.

	Command or Action	Purpose
Step 4	**parameter type urlfpolicy** [**local** | **trend** | **n2h2** | **websense**] *parameter-map-name* **Example:** `Router(config-pmap)# parameter type urlfpolicy trend trend-parameters`	Specifies the parameters in a parameter map for the URL filtering server.
Step 5	**class type urlfilter** [**trend** | **n2h2** | **websense**] *class-map-name* **Example:** `Router(config-pmap)# class type urlfilter trusted-domain-class`	Specifies the class to which the policy applies and enters policy-map class configuration mode.
Step 6	**allow** | **reset** | **server-specified-action** **Example:** `Router(config-pmap-c)# allow`	Specify the action to take: • **allow**—Allows traffic matching the pattern specified by the class. • **reset**—Blocks traffic matching the pattern specified by the class by resetting the connection on both ends. • **server-specified-action**—Allows or blocks traffic as specified by the URL filtering server.
Step 7	**log** **Example:** `Router(config-pmap-c)# log`	(Optional) Logs the request for traffic matching the pattern specified by the class.
Step 8	**exit** **Example:** `Router(config-pmap-c)# exit`	Returns to policy map configuration mode.
Step 9	Repeat Steps 4 through 8 for the remaining classes of traffic to which the policy applies.	(Optional) Specifies additional classes and actions for the policy
Step 10	**exit** **Example:** `Router(config-pmap)# exit`	Returns to global configuration mode.

Attaching a URL Filtering Policy

After you have configured a URL filtering policy, you attach the policy to an inspect type policy map that defines the traffic to be inspected and the actions to be taken based on the characteristics of the traffic. Then, you attach the inspect type policy map as a service policy to a particular target (zone-pair). After you attach the policy, you must configure the interfaces that belong to the zone. See the *Cisco IOS Security Configuration Guide* for more information.

Prerequisites

If you do not want to use the default parameters for inspecting traffic, use the **parameter-map type inspect** command to configure the parameters related to the inspect action.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **class-map type inspect match-all** *class-map-name*
4. **match protocol http**
5. **exit**
6. **policy-map type inspect** *policy-map-name*
7. **class type inspect** *class-map-name*
8. **inspect** *parameter-map-name*
9. **service-policy urlfilter** *policy-map-name*
10. **exit**
11. **class class-default**
12. **drop**
13. **exit**
14. **exit**
15. **zone-pair security** *zone-pair-name* {**source** *source-zone-name* | **self**} **destination** [**self** | *destination-zone-name*]
16. **service-policy type inspect** *policy-map-name*
17. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**class-map type inspect match-all** *class-map-name* **Example:** `Router(config)# class-map type inspect match-all http-class`	Creates an inspect type class map and enters class map configuration mode.

	Command or Action	Purpose
Step 4	**match protocol http** **Example:** `Router(config-cmap)# match protocol http`	Specifies the HTTP protocol as the match criteria for the class map.
Step 5	**exit** **Example:** `Router(config-cmap)# exit`	Returns to global configuration mode.
Step 6	**policy-map type inspect** *policy-map-name* **Example:** `Router(config)# policy-map type inspect trend-global-policy`	Creates an inspect type policy map and enters policy-map configuration mode. This policy map defines the traffic to be inspected and the actions to take on that traffic.
Step 7	**class type inspect** *class-map-name* **Example:** `Router(config-pmap)# class type inspect http-class`	Specifies the HTTP traffic class to be inspected by the policy and enters policy-map class configuration mode.
Step 8	**inspect** *parameter-map-name* **Example:** `Router(config-pmap-c)# inspect global`	Specifies the inspect action on HTTP traffic.
Step 9	**service-policy urlfilter** *policy-map-name* **Example:** `Router(config-pmap-c)# service-policy urlfilter trend-policy`	Attaches the URL filter policy to all HTTP traffic.
Step 10	**exit** **Example:** `Router(config-pmap-c)# exit`	Returns to policy-map configuration mode.
Step 11	**class class-default** **Example:** `Router(config-pmap)# class class-default`	Creates the default class—that is, all traffic that does not match the criteria specified by the HTTP class map—and enters policy-map class configuration mode.
Step 12	**drop** **Example:** `Router(config-pmap-c)# drop`	Specifies the action to take on traffic in the default class—that is, to drop all non-HTTP traffic.
Step 13	**exit** **Example:** `Router(config-pmap-c)# exit`	Returns to policy-map configuration mode.

	Command or Action	Purpose
Step 14	**exit** **Example:** `Router(config-pmap)# exit`	Returns to global configuration mode.
Step 15	**zone-pair security** *zone-pair-name* {**source** *source-zone-name* | **self**} **destination** [**self** | *destination-zone-name*] **Example:** `Router(config)# zone-pair security zp source z1 destination z2`	Creates a zone pair and enters security zone-pair configuration mode.
Step 16	**service-policy type inspect** *policy-map-name* **Example:** `Router(config-sec-zone-pair)# service-policy type inspect trend-policy`	Attaches a URL filtering policy to the destination zone pair.
Step 17	**exit** **Example:** `Router(config-sec-zone-pair)# exit`	Returns to global configuration mode.

Configuration Examples for Cisco IOS Content Filtering

Example: Configuring Class Maps for Local URL Filtering

The following example shows class maps for trusted domains, untrusted domains, and URL keywords. The required parameter maps are configured first.

```
parameter-map type urlf-glob trusted-domain-param
 pattern www.example1.com
 pattern *.example2.com
!
parameter-map type urlf-glob untrusted-domain-param
 pattern www.example3.com
 pattern www.example4.com
!
parameter-map type urlf-glob keyword-param
 pattern mp3
 pattern jobs
```

```
class-map type urlfilter match-any untrusted-domain-class
 match server-domain urlf-glob untrusted-domain-param

class-map type urlfilter match-any trusted-domain-class
 match server-domain urlf-glob trusted-domain-param

class-map type urlfilter match-any keyword-class
 match url-keyword urlf-glob keyword-param
```

Example: Configuring Class Maps for Trend Micro URL Filtering

The following example shows a class map that defines the class drop-category, which specifies traffic that matches the defined URL categories:

```
class-map type urlfilter trend match-any drop-category
 match url category Gambling
 match url category Personals-Dating
```

Example: Configuring Parameter Maps for Trend Micro URL Filtering

The following example shows a parameter map for global Trend Micro parameters and a parameter map for per-policy Trend Micro parameters:

```
parameter-map type trend-global global-param-map
 server trps1.trendmicro.com retrans 5 timeout 200
 cache-entry-lifetime 1
 cache-size maximum-memory 128000

parameter-map type urlfpolicy trend trend-param-map
 block-page message "group2 is blocked by trend"
 max-request 2147483647
 max-resp-pak 20000
 truncate hostname
```

Example: Attaching a URL Filtering Policy

The following example configures an HTTP traffic class and an inspect type policy map that inspects all HTTP traffic, applies the URL filtering policy to that traffic, and ignores all other traffic. Finally, the inspect policy is attached as a service policy to the target zone pair.

```
class-map type inspect match-all http-class
 match protocol http

policy-map type inspect urlfilter trend-global-policy
 class type inspect http-class
  inspect global
  service-policy urlfilter trend-policy
 class class-default
  drop

zone-pair security zp-in source zone-in destination zone-out
 service-policy type inspect trend-global-policy
```

Example: Subscription-Based Content Filtering Sample Configuration

The following sample subscription-based content filtering configuration specifies two different URL filtering policies—one for group one and one for group two:

```
! port map to indicate FW that all 8080 connections are http connections
ip port-map http port 8080

! Trend global parameter-map to specify the TRPS server and cache-sizes
parameter-map type trend-global hello
 server trps1.trendmicro.com
 cache-size maximum-memory 300

! Trend Policy parameter map for group one.
!   If server is down, allow the HTTP connections
parameter-map type urlfpolicy trend trend-g1-param
 allow-mode on
 block-page message "You are prohibited from accessing this web page"

! Trend Policy parameter map for group two.
!   If the server is down block the HTTP connections
parameter-map type urlfpolicy trend trend-g2-params
 block-page message "Restricted access. Please contact your administrator"

! Trend class map for group one
!   Just match bad reputation sites
class-map type urlfilter trend trend-g1-c
 match url reputation ADWARE
 match url reputation DIALER

! Trend class map for group two
!   Match on bad reputation sites and on Gambling and Personals-Dating sites
class-map type urlfilter trend trend-g2-c
 match url reputation ADWARE
 match url reputation PHISHING
 match url category Gambling
 match url category Personals-Dating


! Local filtering class to permit certain domains
parameter-map type urlf-glob p-domains
 pattern "www.example.com"
 pattern "www.example1.com"

class-map type urlfilter p-domains
   match server-domain urlf-glob p-domains

! Local filtering class to deny certain domains
parameter-map type urlf-glob d-domains
 pattern "*.example2.com"
 pattern "www.example3.com"

class-map type urlfilter d-domains
   match server-domain urlf-glob d-domains

! Urlfilter Policy map for group one.
! Don't block any of the domains locally
policy-map type inspect urlfilter g1-pol
 parameter type urlfpolicy trend trend-g1-param
 class type urlfilter p-domains
  allow
 class type urlfilter d-domains
  reset
```

```
 class type urlfilter trend trend-g1-c
  reset

! Url filter policy map for group two
!   Block the deny domains locally
policy-map type inspect urlfilter g2-pol
 parameter type urlfpolicy trend trend-g2-param
 class type urlfilter p-domains
  allow
 class type urlfilter d-domains
  log
  reset
 class type urlfilter trend trend-g2-c
  reset

! First level class to prevent content filtering for websites that are local to the
enterprise
! The first deny line is to make the http connections going to the proxy to not match this
class
ip access-list extended 101
 deny tcp any host 192.168.1.10 eq 8080
 permit tcp any 192.168.0.0 0.0.255.255 eq 80 8080
 permit tcp any 10.0.0.0 0.255.255.255 eq 80 8080

class-map type inspect no-urlf-c
   match access-group 101

! First level class map to support url-filtering for group one
ip access-list extended 102
 permit tcp 192.168.1.0 0.0.0.255 any
class-map type inspect urlf-g1-c
 match protocol http
 match access-group 102

! First level class map to support url-filtering for group two
ip access-list extended 103
 permit tcp 192.168.2.0 0.0.0.255 any
class-map type inspect urlf-g1-c
 match protocol http
 match access-group 103



! First level class map to allow ICMP from protected network to outside
class-map type inspect icmp-c
   match protocol icmp

! First level policy map that brings everything together
! Always configure the class with most restrictions first
policy-map type inspect fw-pol
 class type inspect icmp
  inspect

 class type inspect no-urlf-c
  inspect

 class type inspect urlf-g2-c
  inspect
  service-policy urlfilter g2-pol

 class type inspect urlf-g1-c
  inspect
  service-policy urlfilter g1-pol
```

```
! Create targets to which the FW policy is applied
zone security z1
zone security z2
zone-pair security z1z2 source z1 destination z2
 service-policy type inspect fw-pol

! inside interface
interface FastEthernet 0/0
 ip address 10.1.1.1 255.255.0.0
 zone-member security z1

!outside interface
interface FastEthernet 1/0
 ip address 209.165.200.225 255.255.255.224
 zone-member security z2
```

Example: Configuring URL Filtering with a Websense Server

The following example configures URL filtering with a Websense server:

```
parameter-map type urlfpolicy websense websense-param-map
/* define vendor related info */
 server 192.168.3.1
 port 5000 retrans 3 timeout 200

/* define global info related with URL filtering */
 alert on
 allow-mode off
 urlf-server-log on
 max-request 2000
 max-resp-pak 200
 truncate hostname
 cache-size 256
 cache-entry-lifetime 2
 block-page “This page has been blocked.”

/* define trusted-domain lists */
! Local filtering class to permit certain domains
parameter-map type urlf-glob p-domains
 pattern "www.example.com"
 pattern "www.example1.com"

class-map type urlfilter p-domains
 match server-domain urlf-glob p-domains

! Local filtering class to deny certain domains
parameter-map type urlf-glob d-domains
 pattern "*.example2.com"
 pattern "www.example3.com"

class-map type urlfilter d-domains
 match server-domain urlf-glob d-domains

class-map type urlfilter websense match-any websense-map
 match server-response any

policy-map type inspect urlfilter url-websense-policy
 parameter-map urlfpolicy websense websense-param-map
 class type urlfilter trusted-domain-lists
  allow
 class type urlfilter untrusted-domain-lists
```

```
  reset
 class type urlfilter block-url-keyword-lists
  reset
 class type urlfilter websense websense-map
  server-specified-action

/* define customer group */
access-list 101 permit ip 192.168.1.0 0.0.0.255 any
class-map type inspect match-all urlf-traffic
 match protocol http
 match access-list 101

policy-map type inspect urlfilter-policy
 class type inspect urlf-traffic
  inspect
  service-policy urlfilter url-websense-policy
```

Example: Configuring URL Filtering with a SmartFilter Server

The following example configures URL filtering with a SmartFilter server:

```
parameter-map type urlfpolicy n2h2 n2h2-param-map
/* define vendor related info */
 server 192.168.3.1
 port 5000 retrans 3 timeout 200

/* define global info related with URL filtering */
 alert on
 allow-mode off
 urlf-server-log on
 max-request 2000
 max-resp-pak 200
 truncate hostname
 cache-size 256
 cache-entry-lifetime 2
 block-page "This page has been blocked."

/* define trusted-domain lists */
! Local filtering class to permit certain domains
parameter-map type urlf-glob p-domains
 pattern "www.example.com"
 pattern "www.example1.com"

class-map type urlfilter p-domains
 match server-domain urlf-glob p-domains

! Local filtering class to deny certain domains
parameter-map type urlf-glob d-domains
 pattern "*.example2.com"
 pattern "www.example3.com"

class-map type urlfilter d-domains
 match server-domain urlf-glob d-domains

class-map type urlfilter websense match-any n2h2-map
 match server-response any

policy-map type inspect urlfilter url-n2h2-policy
 parameter-map urlfpolicy n2h2 n2h2-param-map
  class type urlfilter trusted-domain-lists
   allow
```

```
  class type urlfilter untrusted-domain-lists
  reset
  class type urlfilter block-url-keyword-lists
   reset
  class type urlfilter n2h2 n2h2-map
   server-specified-action

/* define customer group */
access-list 101 permit ip 192.168.1.0 0.0.0.255 any
class-map type inspect match-all urlf-traffic
 match protocol http
 match access-list 101

policy-map type inspect urlfilter-policy
 class type inspect urlf-traffic
  inspect
  service-policy urlfilter url-n2h2-policy
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	*Cisco IOS Master Commands List, All Releases*
Security commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	*Cisco IOS Security Command Reference*
The Cisco IOS firewall solution	*Cisco IOS Firewall Overview*

Standards

Standard	Title
None	—

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 1945	*Hypertext Transfer Protocol—HTTP/1.0*
RFC 2616	*Hypertext Transfer Protocol—HTTP/1.1*

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Subscription-Based Cisco IOS Content Filtering

Table 1 lists the features in this module and provides links to specific configuration information.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

Note Table 1 lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Table 1 Feature Information for Subscription-Based Cisco IOS Content Filtering

Feature Name	Releases	Feature Information
Cisco IOS Content Filtering	12.4(15)XZ 12.4(20)T	This feature interacts with the Trend Micro URL filtering service so that HTTP requests can be allowed, blocked, or logged, based on a content filtering policy. The content filtering policy specifies how to handle items such as categories, reputations (or security ratings), trusted domains, untrusted domains, and keywords. The following commands were introduced or modified: **class-map type urlfilter**, **class type urlfilter**, **clear zone-pair urlfilter cache**, **debug cce dp named-db urlfilter**, **debug ip trm**, **debug ip urlfilter**, **match server-domain urlf-glob**, **match server-response anymatch url category**, **match url reputation**, **match url- keyword urlf-glob**, **parameter-map type trend-global**, **parameter-map type urlf-glob**, **parameter-map type urlfpolicy**, **policy-map type inspect urlfilter**, **show class-map type urlfilter**, **show ip trm config**, **show ip trm subscription status**, **show parameter-map type trend-global**, **show parameter-map type urlf-glob**, **show parameter-map type urlfpolicy**, **show policy-map type inspect urlfilter**, **show policy-map type inspect zone-pair**, **show policy-map type inspect zone-pair urlfilter**, **trm register**.