Systems Engineering "How to" Guide

Policy Based Routing on ASA for WSA Transparent Proxy mode Redirection

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PURPOSE OF THIS DOCUMENT

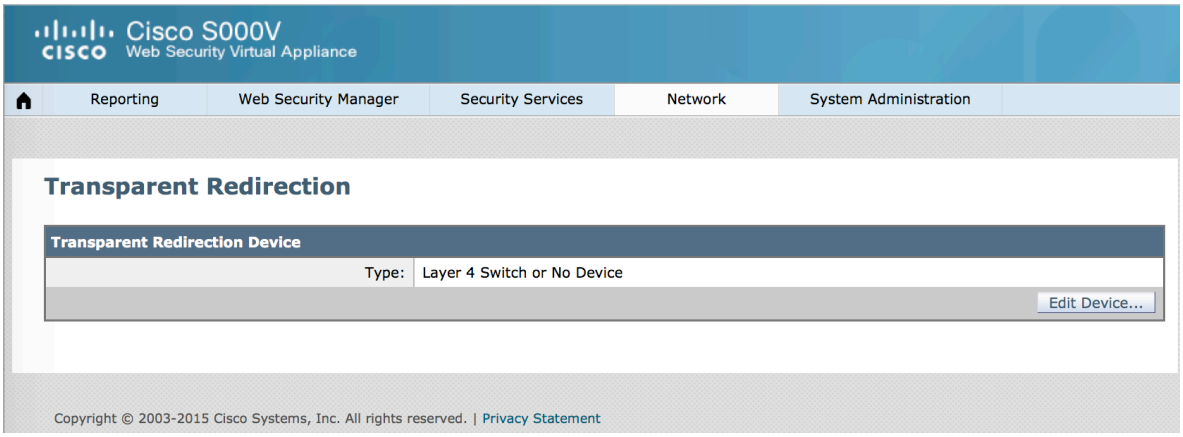
This guide is intended to explain how to configure the Cisco Adaptive Security Appliance (ASA) to use Policy Based Routing to transparently forward traffic to be processed by the Web Security Appliance (WSA).

PRODUCT KNOWLEDGE REQUIREMENTS

- Cisco Web Security Appliance
- Cisco Adaptive Security Appliance

Transparent Redirection

Confirm the WSA is configured to use a Layer-4 switch or No Device in the Transparent Redirection Device settings, in the Web UI (Under Network TAB)



Configuring ports on the WSA for access

There are cases where the ASA may need to be configured to transparently re-direct HTTP and HTTPS traffic to the WSA when WCCP is not a viable configuration option. Policy Based Routing Policy Based Routing (PBR) is a mechanism by which traffic is routed through specific paths with a specified QoS using ACLs. ACLs let traffic be classified based on the content of the packet's Layer 3 and Layer 4 headers. This solution allows Internet service providers and other organizations to route traffic originating from various sets of users through well-defined Internet connections.

Policy Based Routing is supported only in the routed firewall mode. Transparent firewall mode is not supported.

Make sure your ASA is running version 9.4. The following command can be used to check the current version:

```
> show version
```

snipped output:

```
ciscoasa> show version

Cisco Adaptive Security Appliance Software Version 9.1(1)
Device Manager Version 7.1(3)

Compiled on Wed 28-Nov-12 11:15 PST by builders
System image file is "disk0:/asa911-smp-k8.bin"
```

Implementation of PBR

The ASA uses ACLs to match traffic and then perform routing actions on the traffic. Specifically, you configure a route map that specifies an ACL for matching, and then you specify one or more actions for that traffic. Finally, you associate the route map with an interface where you want to apply PBR on all incoming traffic.

Equal-Access and Source-Sensitive Routing

This method is recommended if you have multiple WSA and want to provide equal-access and source-sensitive routing. The traffic (HTTP/HTTPS) can be redirected to the proxies (WSA) using a route-map with an access-list.

Order of Configuration for ASA Policy Based Routing

* Define an access-list
    - IPv6 ACLs are not supported.
* Create a route map entry
* Define the match criteria to be applied using an access-list
* Indicate where to output packets that pass a match clause of a route map for policy routing
* Configure one or more actions
* Configure an interface and enter interface configuration mode
* Configure policy based routing for through-the-box traffic

NOTE

When multiple set actions are configured, PBR will evaluate them in the following order:

```
set ip next-hop verify-availability
set ip next-hop
set ip next-hop recursive
set interface
set ip default next-hop
set default interface
```

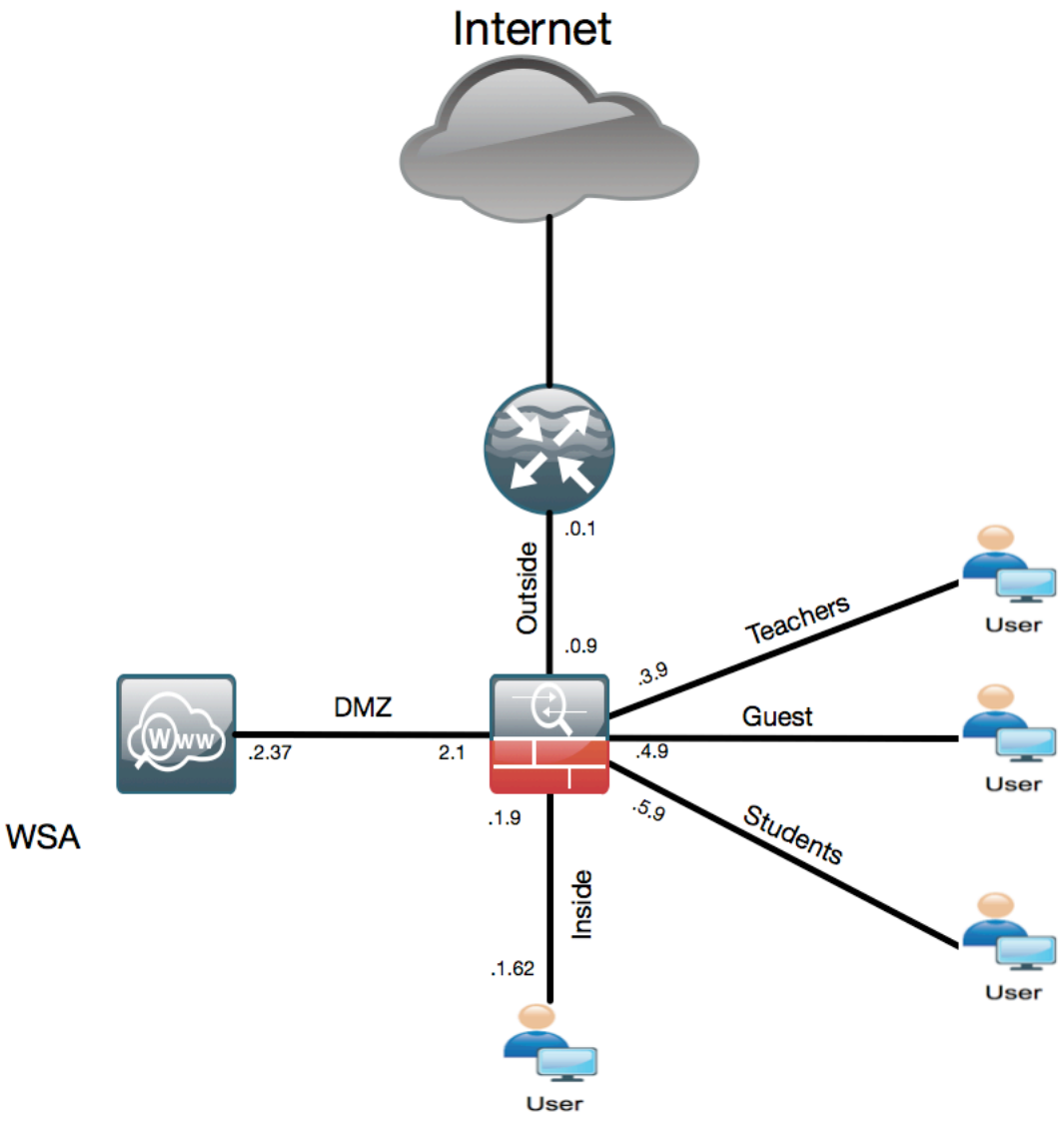
Example

```
interface GigabitEthernet0/0
 nameif outside
 security-level 0
 ip address 192.168.0.9 255.255.255.0

interface GigabitEthernet0/1
 nameif inside
 security-level 100
 ip address 192.168.1.9 255.255.255.0
 policy-route route-map testmap

interface GigabitEthernet0/5
 nameif DMZ
 security-level 100
 ip address 192.168.2.9 255.255.255.0

object network INSIDE_NETWORK
 nat (inside,outside) dynamic interface
object network DMZ_Network
 nat (DMZ,outside) dynamic interface

access-list newtestacl extended permit tcp host 192.168.1.62 any4 eq https log
access-list newtestacl extended permit tcp host 192.168.1.62 any4 eq www log

route-map testmap permit 1
 match ip address newtestacl
 set ip next-hop 192.168.2.37
 set interface inside DMZ
```

WARNING: In the above example, if the access-list “newtestacl” with destination "any\any4\any6" is used as the match criteria for a route map, and applied to any routing protocol it will have no effect. Instead use a standard ACL or an extended ACL without any\any4\any6 in the destination.

RECOMMENDATION: Unless you have IPv6 hosts, use ANY4 (for IPv4 only).

ASA (Adaptive Security Appliance)
PBR (Policy-Based Routing)
WSA (Web Security Appliance)



* Although the diagram above shows different network segments, the configuration listed in this document covers a basic scenario on which the WSA will be used to proxy traffic from the inside network. Adding other ACLs and Route-map, will cover other network segments.

Troubleshooting

Various tools can be used to troubleshoot PBR on ASA. Please find some, but not all of the commands below:

Capture

Enable packet capture capabilities for packet sniffing and network fault isolation.

capture capture_name [type {asp-drop all [drop-code] | tls-proxy | raw-data | lacp | isakmp [ikev1 | ikev2] | inline-tag [tag] |webvpn user webvpn-user}] [access-list access_list_name] [interface asa_dataplane] [buffer buf_size] [ethernet-type type] [interface interface_name] [reeinject-hide] [packet-length bytes] [circular-buffer] [trace trace_count] [real-time] [trace] [match prot {host source-ip | source-ip mask | any} {host destination-ip |destination-ip mask} [any} [operator port]

Example:

```
capture IN interface inside match tcp any any eq 80
```

Reference:
CLI Book 1: Cisco ASA Series General Operations CLI Configuration Guide, 9.4

—

show arp

To display the Address Resolution Protocol (ARP)

Packet-Tracer

The trace does policy lookup to test access rules, NAT, routing, and so forth, to see if the packet would be permitted or denied.

packet-tracer input ifc_name {icmp | tcp | udp | rawip} [inline-tag tag] ...

Example:

```
packet-tracer input inside tcp 192.168.1.62 12345 5.1.1.1 80 detail
packet-tracer input inside tcp 192.168.1.62 12345 5.1.1.1 81 detail
```

Reference:
CLI Book 1: Cisco ASA Series General Operations CLI Configuration Guide, 9.4

WSA Logs

```
1448473822.281 980 192.168.1.62 TCP_CLIENT_REFRESH_MISS_SSL/200 1524 POST
https://www.facebook.com:443/ajax/litestand/newsfeed_count?__pc=EXP1%3ADEFAULT -
DIRECT/www.facebook.com application/x-javascript DEFAULT_CASE_12-DefaultGroup-DefaultGroup-NONE-
NONE-NONE-DefaultGroup <IW_snet,3.8,0,"-",0,0,0,1,"-",-,-,-,"-",1,-,"-","-",-,-,IW_snet,-
,"Unknown","-","Facebook General","Facebook","-","-",12.44,0,-,"Unknown","-",-,"-",-,-,"-","-"> -
"25/Nov/2015:15:50:22 -0200"
1448473834.026 1106 192.168.1.62 TCP_CLIENT_REFRESH_MISS_SSL/200 2530 POST
https://www.facebook.com:443/ajax/chat/buddy_list.php?__pc=EXP1%3ADEFAULT -
DIRECT/www.facebook.com application/x-javascript DEFAULT_CASE_12-DefaultGroup-DefaultGroup-NONE-
NONE-NONE-DefaultGroup <IW_chat,3.8,0,"-",0,0,0,1,"-",-,-,-,"-",1,-,"-","-",-,-,IW_chat,-
,"Unknown","-","Facebook Messages and Chat","Facebook","-","-",18.30,0,-,"Unknown","-",-,"-",-,-
,"-","-"> - "25/Nov/2015:15:50:33 -0200"
1448473835.035 715 192.168.1.62 TCP_CLIENT_REFRESH_MISS_SSL/200 2544 POST
https://www.facebook.com:443/chat/user_info/?__pc=EXP1%3ADEFAULT - DIRECT/www.facebook.com
application/x-javascript DEFAULT_CASE_12-DefaultGroup-DefaultGroup-NONE-NONE-NONE-DefaultGroup
<IW_chat,3.8,0,"-",0,0,0,1,"-",-,-,-,"-",1,-,"-","-",-,-,IW_chat,-,"Unknown","-","Facebook
Messages and Chat","Facebook","-","-",28.46,0,-,"Unknown","-",-,"-",-,-,"-","-"> -
"25/Nov/2015:15:50:34 -0200"
1448473865.034 50818 192.168.1.62 TCP_MISS_SSL/200 408 GET https://2-edge-
chat.facebook.com:443/pull?channel=p_100000753947921&seq=8&partition=-
2&clientid=5439826e&cb=a7nf&idle=1576&qp=y&cap=8&isq=4802&msgs_recv=8&uid=100000753947921&viewer_u
id=100000753947921&sticky_token=170&sticky_pool=atn1c08_chat-proxy - DIRECT/2-edge-
chat.facebook.com text/plain DEFAULT_CASE_12-DefaultGroup-DefaultGroup-NONE-NONE-NONE-DefaultGroup
<IW_snet,3.8,0,"-",0,0,0,1,"-",-,-,-,"-",1,-,"-","-",-,-,IW_snet,-,"Unknown","-","Facebook
General","Facebook","-","-",0.06,0,-,"Unknown","-",-,"-",-,-,"-","-"> - "25/Nov/2015:15:51:04 -
0200"
```

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