



PALO ALTO NETWORKS EDU 210

Lab 7: Blocking Threats from Known-Bad Sources

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Introduction

You need to make certain that the firewall blocks traffic, both to and from known malicious IP addresses, hostnames, and domain names. There are numerous external blocklists that you may want to implement on the Palo Alto Networks firewall. You also need to implement your own custom lists of IP addresses, hostnames, and domain names to block traffic based on various corporate policies. Upper management is also concerned that some users have been accessing inappropriate web content from their corporate devices. You need to configure the firewall to block browsing to certain categories of web traffic, including adult and nudity.

You are concerned about users accessing websites that are often the source of malicious files and content, such as viruses and spyware.

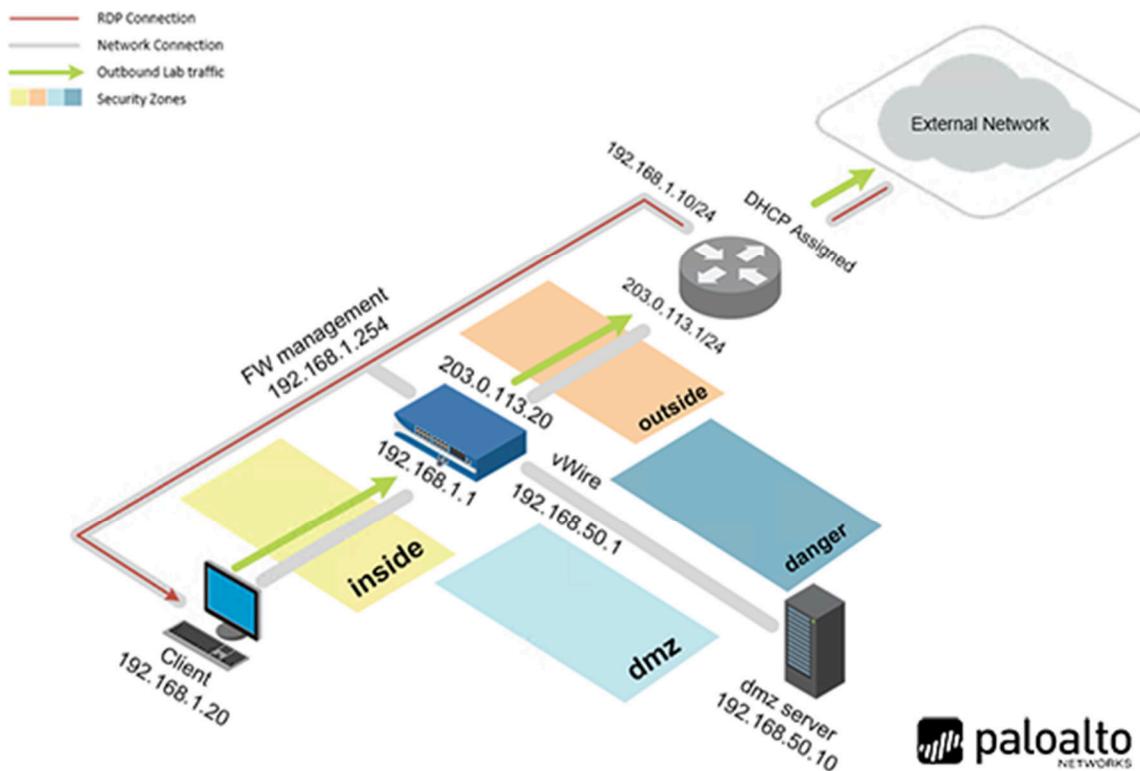
In this section, you will explore the options available on the firewall that allow you to block individual addresses, groups of addresses, and lists of addresses. You will also configure the firewall to block certain categories of websites.

Objective

In this lab, you will perform the following tasks:

- Load a baseline configuration
- Block access to malicious IP addresses using address objects
- Block access to malicious IP addresses using address Groups
- Block access to malicious IP addresses using geographic regions
- Block access to malicious IP addresses using an External Dynamic List (EDL)
- Block access to malicious domains using an EDL
- Block access to malicious URLs using the security policy
- Block access to a malicious URL using a URL filtering profile

Lab Topology



Lab Settings

The information in the table below will be needed to complete the lab. The task sections below provide details on the use of this information.

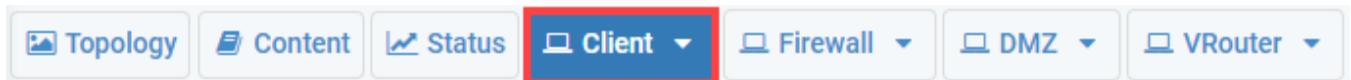
Virtual Machine	IP Address	Account (if needed)	Password (if needed)
Client	192.168.1.20	lab-user	Pa10Alt0!
DMZ	192.168.50.10	root	Pa10Alt0!
Firewall	192.168.1.254	admin	Pa10Alt0!
VRouter	192.168.1.10	root	Pa10Alt0!

7 Block Threats from Known-Bad Sources

7.1 Apply a Baseline Configuration to the Firewall

In this section, you will load the firewall configuration file.

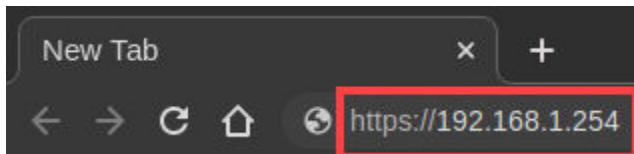
1. Click on the **Client** tab to access the *Client PC*.



2. Double-click the **Chromium Web Browser** icon located on the *desktop*.



3. In the *Chromium* address field, type **https://192.168.1.254** and press **Enter**.



4. You will see a “Your connection is not private” message. Click on the **ADVANCED** link.



Your connection is not private

Attackers might be trying to steal your information from **192.168.1.254** (for example, passwords, messages, or credit cards). [Learn more](#)

NET::ERR_CERT_AUTHORITY_INVALID

[Advanced](#)

[Back to safety](#)



If you experience the “Unable to connect” or “502 Bad Gateway” message while attempting to connect to the specified IP above, please wait an additional 1-3 minutes for the Firewall to fully initialize. Refresh the page to continue.

5. Click on **Proceed to 192.168.1.254 (unsafe)**.



Your connection is not private

Attackers might be trying to steal your information from **192.168.1.254** (for example, passwords, messages, or credit cards). [Learn more](#)

NET::ERR_CERT_AUTHORITY_INVALID

[Hide advanced](#)

[Back to safety](#)

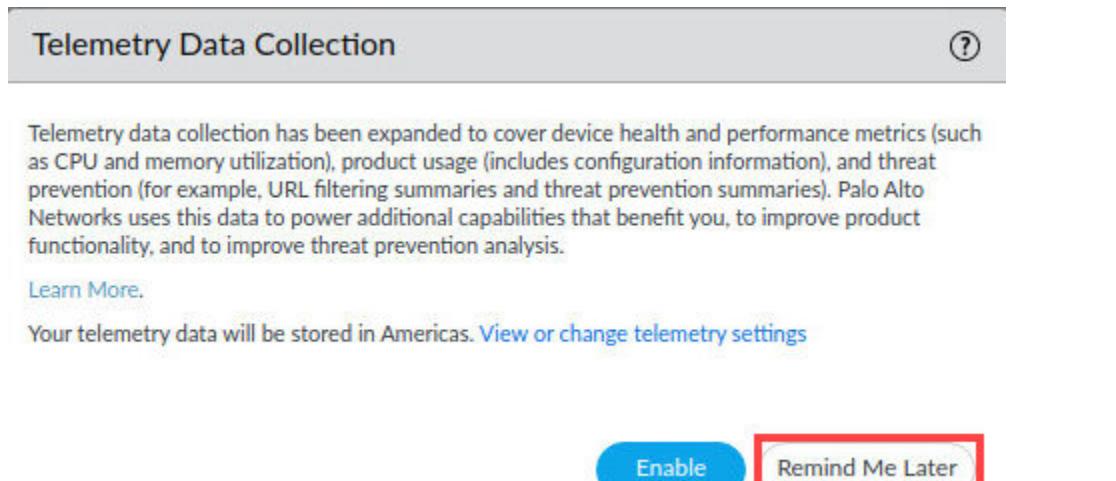
This server could not prove that it is **192.168.1.254**; its security certificate is not trusted by your computer's operating system. This may be caused by a misconfiguration or an attacker intercepting your connection.

[Proceed to 192.168.1.254 \(unsafe\)](#)

6. Log in to the firewall web interface as username **admin**, password **Pa10Alt0!**.



7. In the *Telemetry Data Collection* pop-up, click **Remind Me Later**.



Telemetry Data Collection

Telemetry data collection has been expanded to cover device health and performance metrics (such as CPU and memory utilization), product usage (includes configuration information), and threat prevention (for example, URL filtering summaries and threat prevention summaries). Palo Alto Networks uses this data to power additional capabilities that benefit you, to improve product functionality, and to improve threat prevention analysis.

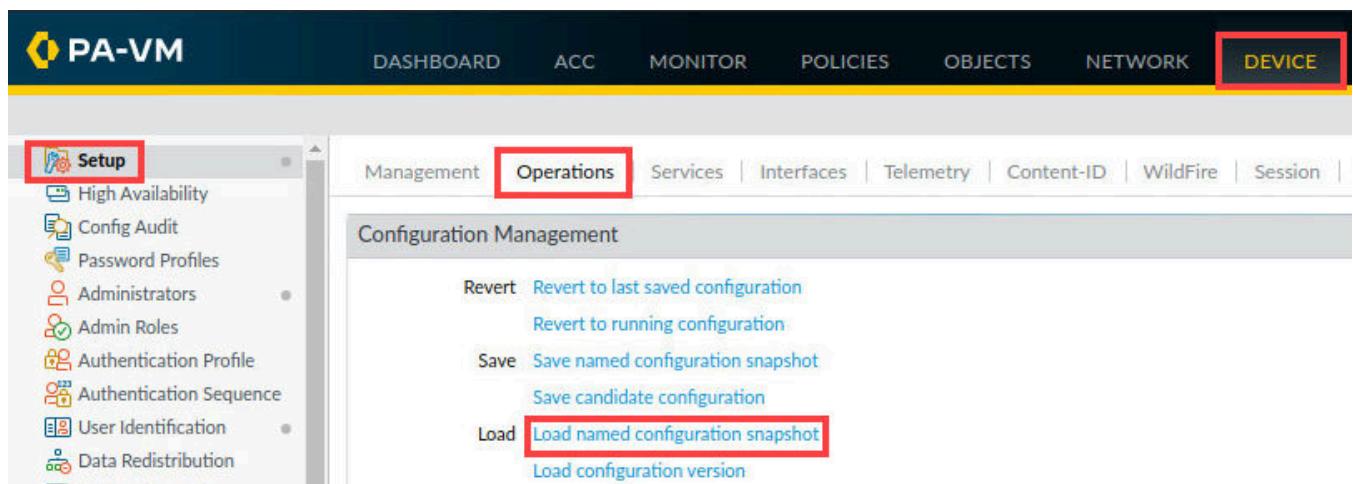
[Learn More.](#)

Your telemetry data will be stored in Americas. [View or change telemetry settings](#)

Enable **Remind Me Later**

Please Note Before you can enable Telemetry Data Collection, you would need to install a device certificate. For this lab, you will not be using Telemetry Data Collection.

8. In the web interface, navigate to **Device > Setup > Operations** and click on **Load named configuration snapshot** underneath the *Configuration Management* section.



PA-VM

DASHBOARD ACC MONITOR POLICIES OBJECTS NETWORK **DEVICE**

Setup

- High Availability
- Config Audit
- Password Profiles
- Administrators
- Admin Roles
- Authentication Profile
- Authentication Sequence
- User Identification
- Data Redistribution

Management **Operations** Services Interfaces Telemetry Content-ID WildFire Session

Configuration Management

Revert: [Revert to last saved configuration](#)
[Revert to running configuration](#)

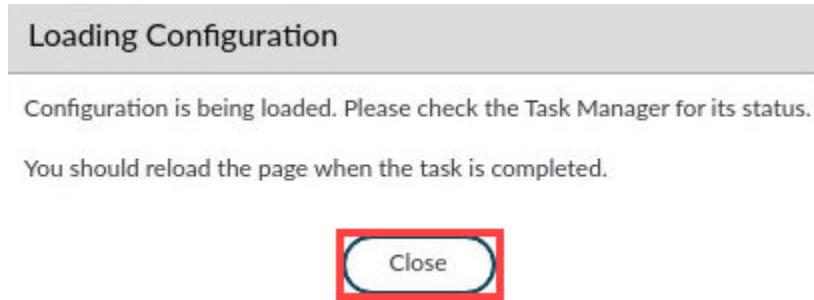
Save: [Save named configuration snapshot](#)
[Save candidate configuration](#)

Load: **Load named configuration snapshot** [Load configuration version](#)

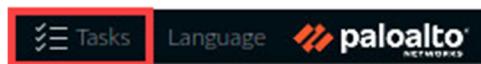
9. In the *Load Named Configuration* window, select **edu-210-lab-07.xml** from the *Name* dropdown box and click **OK**.



10. In the *Loading Configuration* window, a message will show *Configuration is being loaded. Please check the Task Manager for its status. You should reload the page when the task is completed.* Click **Close** to continue.



11. Click the **Tasks** icon located at the bottom-right of the web interface.



12. In the *Task Manager – All Tasks* window, verify the *Load* type has successfully completed. Click **Close**.

Task Manager - All Tasks

TYPE	STATUS	START TIME	MESSAGES	ACTION
Download	Completed	08/05/21 00:03:04		
Load	Completed	08/05/21 00:01:59		
EDLRefresh	Completed	08/04/21 23:58:15		
EDLFetch	Completed	08/04/21 23:58:14		
Download	Completed	08/04/21 23:58:04		
Download	Completed	08/04/21 23:54:04		
EDLFetch	Completed	08/04/21 23:53:13		
Auto Commit	Completed	08/04/21 23:52:45		

Show All Tasks | Clear Commit Queue | **Close**

13. Click the **Commit** link located at the top-right of the web interface.



14. In the *Commit* window, click **Commit** to proceed with committing the changes.

Commit

Only a full commit is available at the current time. You may preview changes or validate the configuration or add a description to the commit.

COMMIT SCOPE	LOCATION TYPE
Commit Scope is unavailable when a full commit is required	

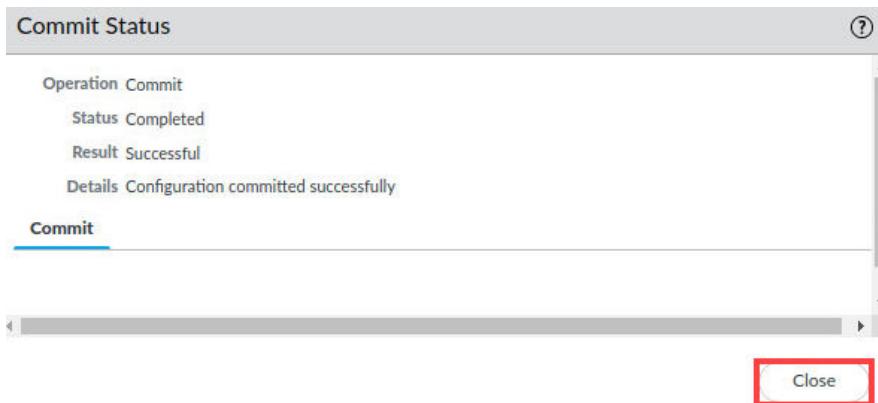
Preview Changes **Change Summary** **Validate Commit** Group By Location Type

Note: This shows all the changes in login admin's accessible domain.

Description

Commit **Cancel**

15. When the *Commit* operation successfully completes, click **Close** to continue.



The commit process takes changes made to the Firewall and copies them to the running configuration, which will activate all configuration changes since the last commit.

16. Leave the *Palo Alto Networks Firewall* open and continue to the next task.

7.2 Test Access to Known Malicious IP Addresses

You can use security policy rules to block access to known malicious IP addresses. Because the list of malicious IP addresses can quickly change, you will treat two legitimate IP addresses as though they are malicious and block access to them.

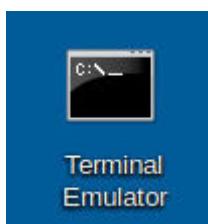
Please Note

Although you can block access to specific IP addresses, Palo Alto Networks recommends that you use a positive enforcement model whenever possible. Use of a positive enforcement model means that you configure a security policy to pass what is allowed rather than what should be blocked, with the assumption that anything not specifically allowed is blocked by default.

1. Minimize the *Chromium* browser by clicking the **minimize** icon and continue to the next task.



2. On the *client desktop*, open a *terminal* window by double-clicking **Terminal Emulator**.



3. Enter the command below to obtain the IP Address of 2600.org. Write down the **IP address** or **copy** and paste it into a text document on the *desktop*.

```
C:\home\lab-user\Desktop\Lab-Files> nslookup 2600.org
```

```
Terminal
C:\home\lab-user\Desktop\Lab-Files> nslookup 2600.org
;; Got recursion not available from 192.168.50.53, trying next server
Server:      1.1.1.1
Address:      1.1.1.1#53

Non-authoritative answer:
Name: 2600.org
Address: 166.84.5.162
;; Got recursion not available from 192.168.50.53, trying next server
C:\home\lab-user\Desktop\Lab-Files>
```

4. In the same **CMD** window, enter the command below. Write down the **IP address** or **copy** and paste it into a text document on the *desktop*.

```
C:\home\lab-user\Desktop\Lab-Files> nslookup www.breakthesecurity.com
```

```
C:\home\lab-user\Desktop\Lab-Files> nslookup www.breakthesecurity.com
;; Got recursion not available from 192.168.50.53, trying next server
Server:      1.1.1.1
Address:      1.1.1.1#53

Non-authoritative answer:
Name: www.breakthesecurity.com
Address: 162.255.119.249
;; Got recursion not available from 192.168.50.53, trying next server
C:\home\lab-user\Desktop\Lab-Files>
```

5. In the same **CMD** window, verify connectivity to the websites by entering the commands below. You will **ping** two IP Addresses. Use **Ctrl+C** to stop the ping for the two commands after a few seconds.

```
C:\home\lab-user\Desktop\Lab-Files> ping 2600.org <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping 2600.org
PING 2600.org (166.84.5.162) 56(84) bytes of data.
64 bytes from phalse.2600.com (166.84.5.162): icmp_seq=1 ttl=50 time=21.4 ms
64 bytes from phalse.2600.com (166.84.5.162): icmp_seq=2 ttl=50 time=20.7 ms
64 bytes from phalse.2600.com (166.84.5.162): icmp_seq=3 ttl=50 time=21.0 ms
^C
--- 2600.org ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 20.784/21.083/21.418/0.260 ms
C:\home\lab-user\Desktop\Lab-Files>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping www.breakthesecurity.com <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping www.breakthesecurity.com
PING www.breakthesecurity.com (162.255.119.249) 56(84) bytes of data.
64 bytes from 162.255.119.249 (162.255.119.249): icmp_seq=1 ttl=46 time=120 ms
64 bytes from 162.255.119.249 (162.255.119.249): icmp_seq=2 ttl=46 time=124 ms
64 bytes from 162.255.119.249 (162.255.119.249): icmp_seq=3 ttl=46 time=133 ms
64 bytes from 162.255.119.249 (162.255.119.249): icmp_seq=4 ttl=46 time=128 ms
^C
--- www.breakthesecurity.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3002ms
rtt min/avg/max/mdev = 120.138/126.615/133.107/4.823 ms
C:\home\lab-user\Desktop\Lab-Files>
```

Please
Note

Here, pinging *2600.org* and *breakthesecurity.com* will be successful.
Access will be blocked in the next tasks.

6. Minimize the *Terminal* window by clicking the **minimize** icon in the upper-right.



7. If you minimized the *firewall*, reopen the *firewall* interface by clicking on the **Chromium** tab in the taskbar. Leave the *firewall* interface open and continue to the next task.



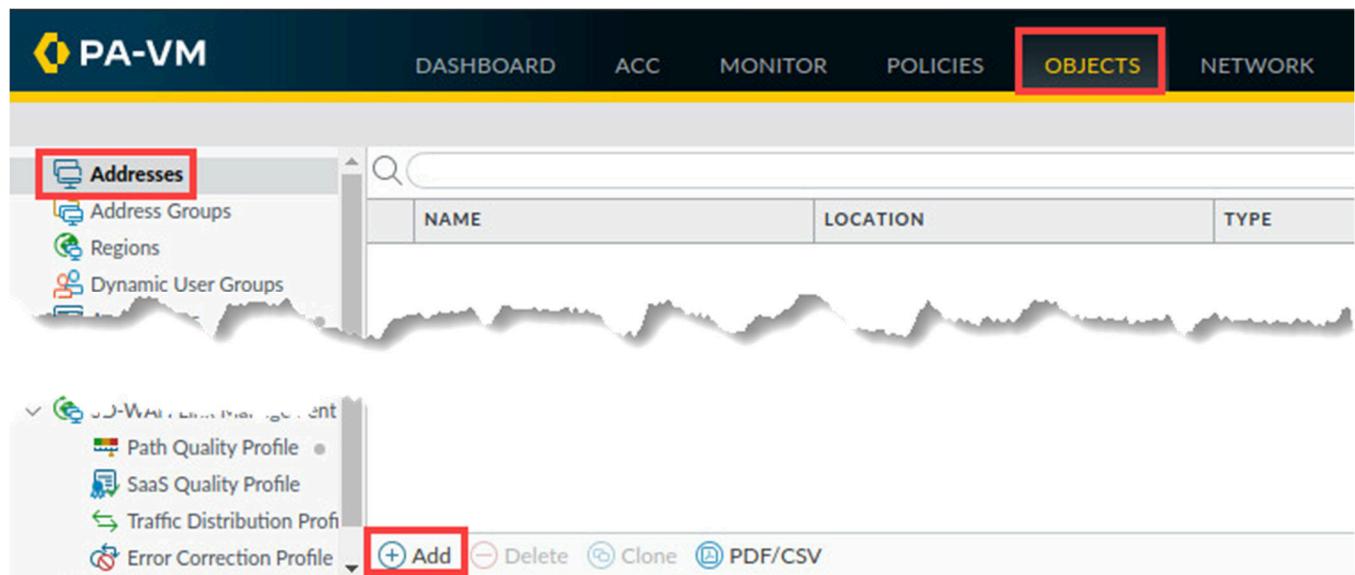
7.3 Block Access to Malicious IP Addresses Using Address Objects

Be aware that the list of malicious IP addresses quickly changes, so keeping your Address objects current could be problematic. For this reason, later lab exercises will illustrate more automated methods to block the current list of malicious IP addresses.

In this section, you will create an Address object that contains a list of malicious IP addresses. You will use this Address object in the security policy to block access to the malicious IP addresses.

Lastly, you will test access to the IP Addresses contained in the Address Objects.

1. In the PA-VM interface, select **Objects > Addresses**. Click **Add**.



The screenshot shows the PA-VM interface with the 'OBJECTS' tab selected. Under the 'Addresses' sub-tab, there is a table with columns: NAME, LOCATION, and TYPE. Below the table, there is a list of profiles: Path Quality Profile, SaaS Quality Profile, Traffic Distribution Profile, and Error Correction Profile. The 'Add' button is highlighted with a red box.

2. In the *Address* window, configure the following. Click **OK**.

Parameter	Value
Name	malicious-ip-address-1
Description	2600.org IP address
Type	IP Netmask
(address text box)	<IP_address_of_2600.org>

Address

Name: **malicious-ip-address-1**

Description: **2600.org IP address**

Type: **IP Netmask** [Resolve](#)

Enter an IP address or a network using the slash notation (Ex. 192.168.80.150 or 192.168.80.0/24). You can also enter an IPv6 address or an IPv6 address with its prefix (Ex. 2001:db8:123:1::1 or 2001:db8:123:1::/64)

Tags:

OK **Cancel**

Please Note

Note that the IP address you enter may be different from the previous example.

3. In the *Addresses* window, click **Add**.

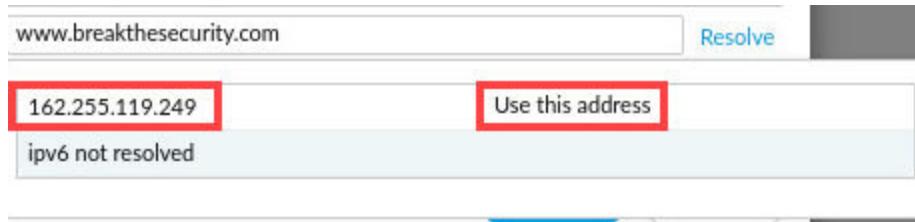


4. In the *Address* window, configure the following. Click **Resolve**.

Parameter	Value
Name	malicious-fqdn-1
Description	www.breakthesecurity.com
Type	FQDN
(FQDN text box)	www.breakthesecurity.com



5. Once you click **Resolve**, you will be prompted to select **Use this Address**.



6. In the *Address* window, click **OK**.



7. Confirm the *address* objects appear in the *Addresses* window.

	NAME	LOCATION	TYPE	ADDRESS
<input type="checkbox"/>	malicious-fqdn-1		IP Netmask	162.255.119.249
<input type="checkbox"/>	malicious-ip-address-1		IP Netmask	166.84.5.162

8. Select **Policies > Security**. Click **Add** to create a new security policy rule.

NAME	TAGS	TYPE	ZONE	ADD
1 Users_to_Extranet	none	universal	Users_Net	any
2 Users_to_Internet	none	universal	Users_Net	any
3 Extranet_to_Internet	none	universal	Extranet	any
4 intrazone-default	none	intrazone	any	any
5 interzone-default	none	interzone	any	any

9. In the *Security Policy Rule* window, on the *General* tab, type **Block-Known-Bad-IPs** as the *Name*. For *Description*, enter **Blocks traffic to malicious address objects**.

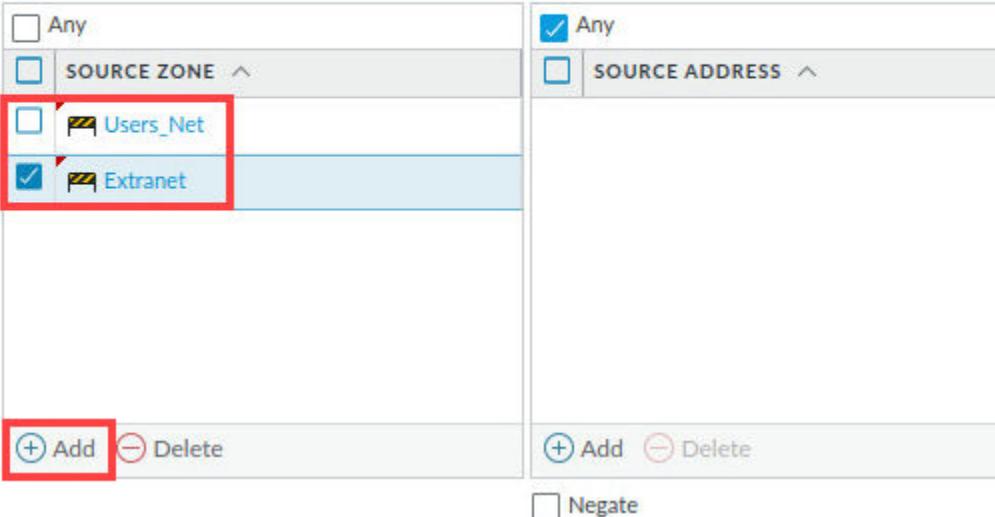
General	Source	Destination	Application	Service/URL Category	Actions
Name: block-known-Bad-IPs					
Rule Type: universal (default)					
Description: Blocks traffic to malicious address objects					

10. Click the **Source** tab and configure the following.

Parameter	Value
Source Zone	Add Users_Net and Extranet
Source Address	Any

Security Policy Rule

General **Source** Destination Application Service/URL Category Actions

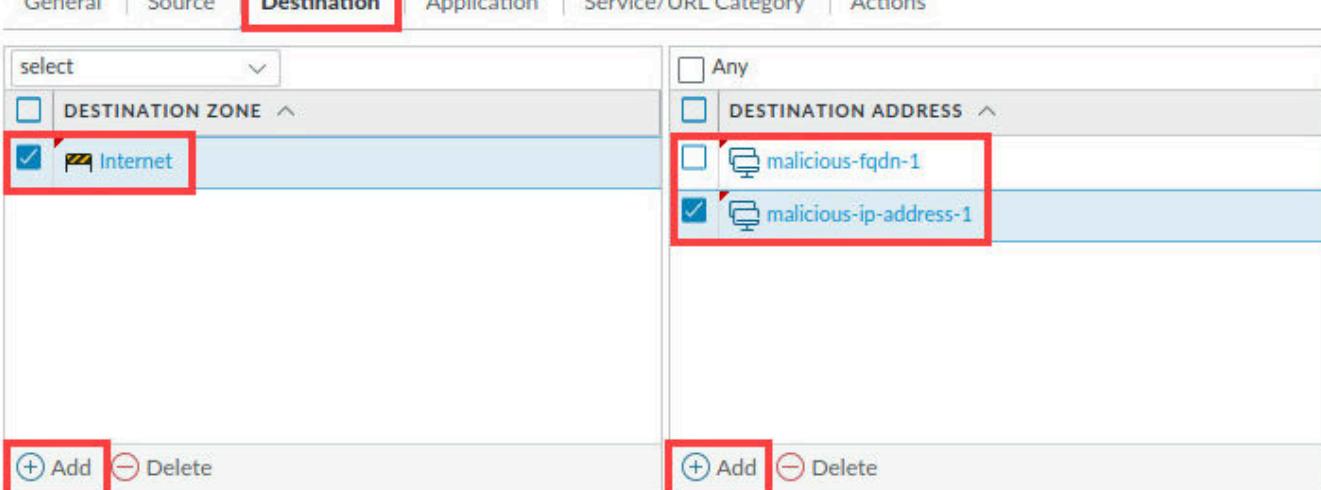


11. Click the **Destination** tab and configure the following.

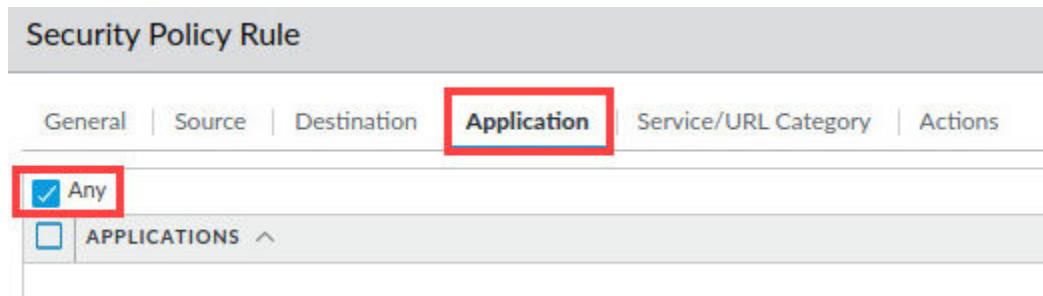
Parameter	Value
Destination Zone	Add Internet
Destination Address	Add malicious-fqdn-1 and malicious-ip-address-1

Security Policy Rule

General Source **Destination** Application Service/URL Category Actions

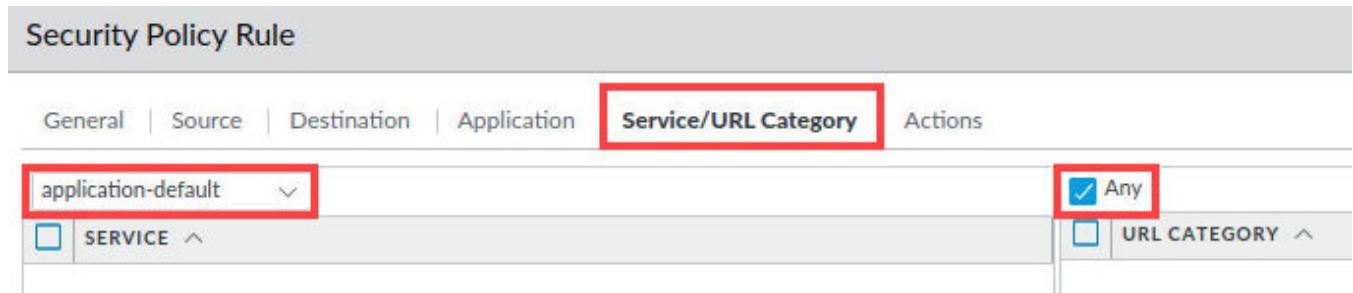


12. Click the **Application** tab and verify that **Any** is selected.



The screenshot shows the 'Security Policy Rule' configuration interface. The 'Application' tab is selected, indicated by a red box. Under the 'Application' section, the 'Any' checkbox is checked, also indicated by a red box. Below it, there is a dropdown menu labeled 'APPLICATIONS'.

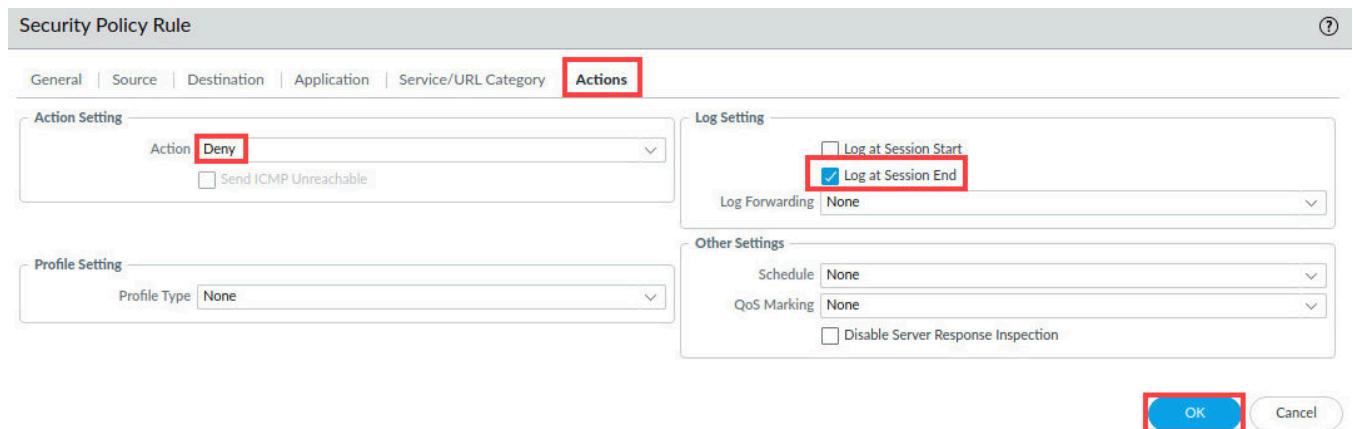
13. Click the **Service/URL Category** tab and verify that **application-default** and **Any** are selected.



The screenshot shows the 'Security Policy Rule' configuration interface. The 'Service/URL Category' tab is selected, indicated by a red box. Under the 'Service/URL Category' section, 'application-default' is selected in the dropdown, indicated by a red box. To the right, the 'Any' checkbox is checked, also indicated by a red box. Below it, there is a dropdown menu labeled 'URL CATEGORY'.

14. Click the **Actions** tab and configure the following. Click **OK**.

Parameter	Value
Action	Deny
Log Setting	Log at Session End

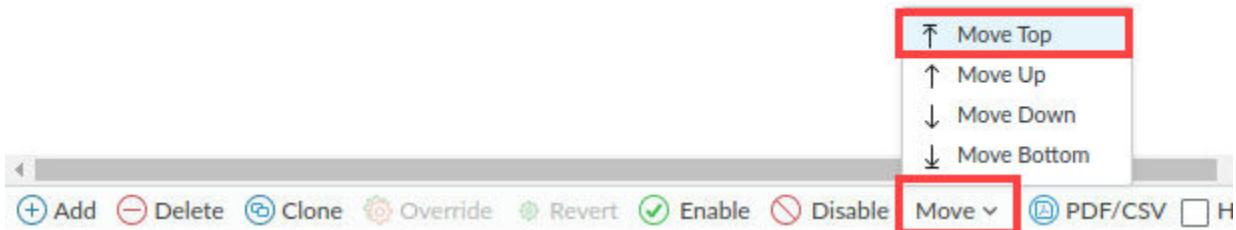


The screenshot shows the 'Security Policy Rule' configuration interface. The 'Actions' tab is selected, indicated by a red box. Under the 'Action Setting' section, the 'Action' dropdown is set to 'Deny', indicated by a red box. Under the 'Log Setting' section, the 'Log at Session End' checkbox is checked, indicated by a red box. At the bottom right, the 'OK' button is highlighted with a red box.

15. Select, but do not open, the **Block-Known-Bad-IPs** rule in the security policy.

	NAME	TAGS	TYPE	Source	
				ZONE	ADDRESS
1	Users_to_Extranet	none	universal	Users_Net	any
2	Users_to_Internet	none	universal	Users_Net	any
3	Extranet_to_Internet	none	universal	Extranet	any
4	Block-known-Bad-IPs	none	universal	Extranet	any
				Users_Net	
5	intrazone-default	none	intrazone	any	any
6	interzone-default	none	interzone	any	any

16. At the bottom of the window, select **Move > Move Top** to move the rule to the top of the security policy.



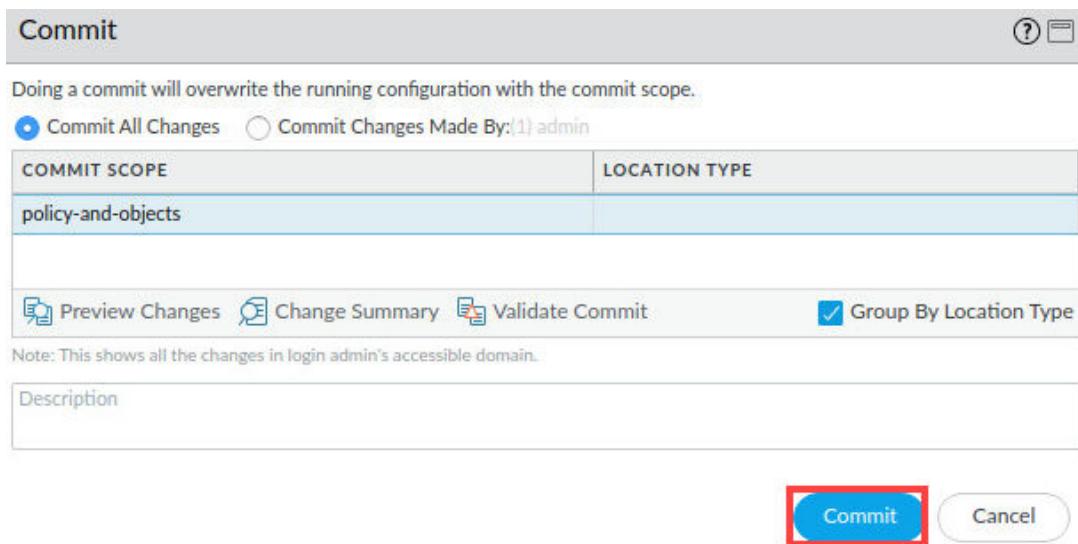
17. Verify that the **Block-Known-Bad-IPs** rule is rule number 1.

	NAME	TAGS	TYPE	Source	
				ZONE	ADDRESS
1	Block-known-Bad-IPs	none	universal	Extranet	any
				Users_Net	
2	Users_to_Extranet	none	universal	Users_Net	any
3	Users_to_Internet	none	universal	Users_Net	any
4	Extranet_to_Internet	none	universal	Extranet	any
5	intrazone-default	none	intrazone	any	any
6	interzone-default	none	interzone	any	any

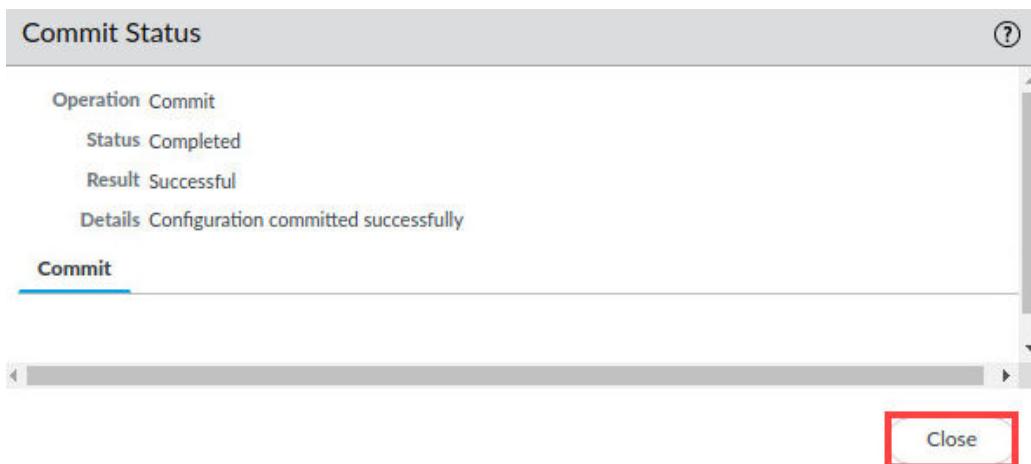
18. Click the **Commit** button at the upper-right of the web interface.



19. In the *Commit* window, click **Commit**.



20. Wait until the *Commit* process is complete. Click **Close**.



21. Minimize the *Chromium* browser by clicking the **minimize** icon and continue to the next task.



22. Return to the *terminal* window by clicking on the **Terminal** icon in the taskbar of your *client desktop*.



23. From the *terminal* window on the *desktop*, enter the following commands. Use **Ctrl+C** to stop the ping for the two commands after a few seconds.

```
C:\home\lab-user\Desktop\Lab-Files> ping 2600.org <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping 2600.org
PING 2600.org (166.84.5.162) 56(84) bytes of data.
^C
--- 2600.org ping statistics ---
11 packets transmitted, 0 received, 100% packet loss, time 10227ms

C:\home\lab-user\Desktop\Lab-Files> █
```

Please
Note

Pinging 2600.org will fail.

```
C:\home\lab-user\Desktop\Lab-Files> ping www.breakthesecurity.com <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping www.breakthesecurity.com
PING www.breakthesecurity.com (162.255.119.249) 56(84) bytes of data.
^C
--- www.breakthesecurity.com ping statistics ---
3 packets transmitted, 0 received, 100% packet loss, time 2048ms

C:\home\lab-user\Desktop\Lab-Files> █
```

Please
Note

Pinging www.breakthesecurity will fail because access to the IP addresses was blocked by the Address objects in the Security policy.

24. Minimize the *Terminal* window by clicking the **minimize** icon in the upper-right.



25. If you minimized the *firewall*, reopen the *firewall* interface by clicking on the **Chromium** tab in the taskbar. Leave the *firewall* interface open and continue to the next task.



26. Navigate to **Monitor > Logs > Traffic**. Enter the filter (**action eq deny**) in the *Filter builder* to look for traffic that has been denied. You should see entries indicating that your **Block-Known-Bad-IPs** security policy rule has denied traffic to each host.

Please Note Note some columns have been adjusted to view the information shown in the screen shot.

27. Leave the *Palo Alto Networks Firewall* open and continue to the next task.

7.4 Block Access to Malicious IP Addresses Using Address Groups

You can use Address Groups in security policy rules to control access to IP addresses. You can group multiple Address objects in an Address Group and then use just the Address Group in your security policy rules. Address Groups are used to shorten and simplify a policy or a policy rule.

You will create a static Address Group, add two Address objects to the group, and then modify the security policy to use the Address Group.

Lastly, you will test access to the IP addresses contained in the Address objects.

1. In the *firewall* interface, select **Objects > Address Groups**. Click **Add**.

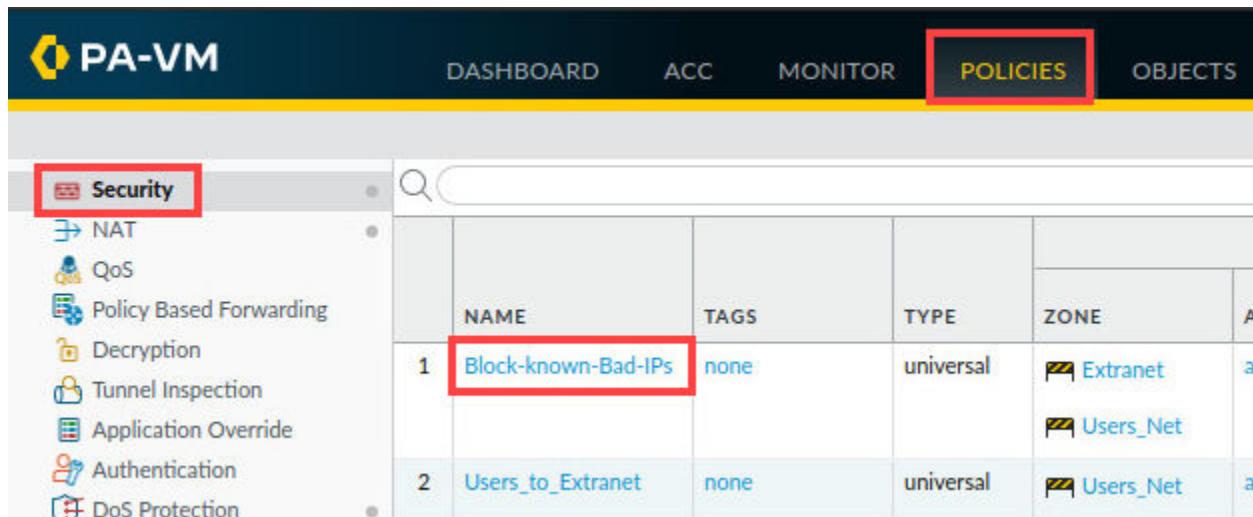
The screenshot shows the PA-VM firewall interface. The top navigation bar has tabs for DASHBOARD, ACC, MONITOR, POLICIES, **OBJECTS** (which is highlighted with a red box), and NETWORK. On the left, a sidebar menu includes Address Groups (highlighted with a red box), Regions, Dynamic User Groups, Applications, and SD-WAN Link Management (with sub-options for Path Quality Profile, SaaS Quality Profile, and Traffic Distribution Profile). Below the sidebar is a search bar and a table with columns for NAME, LOCATION, and MEM. At the bottom of the interface, there is a toolbar with icons for Delete, Clone, and PDF/CSV, and a prominent red box highlights the '+ Add' button.

2. In the *Address Group* window, configure the following. Click **OK**.

Parameter	Value
Name	Malicious-IP-Group
Description	Contains malicious IP address objects
Type	Static
Addresses	Add malicious-fqdn-1 and malicious-ip-address-1

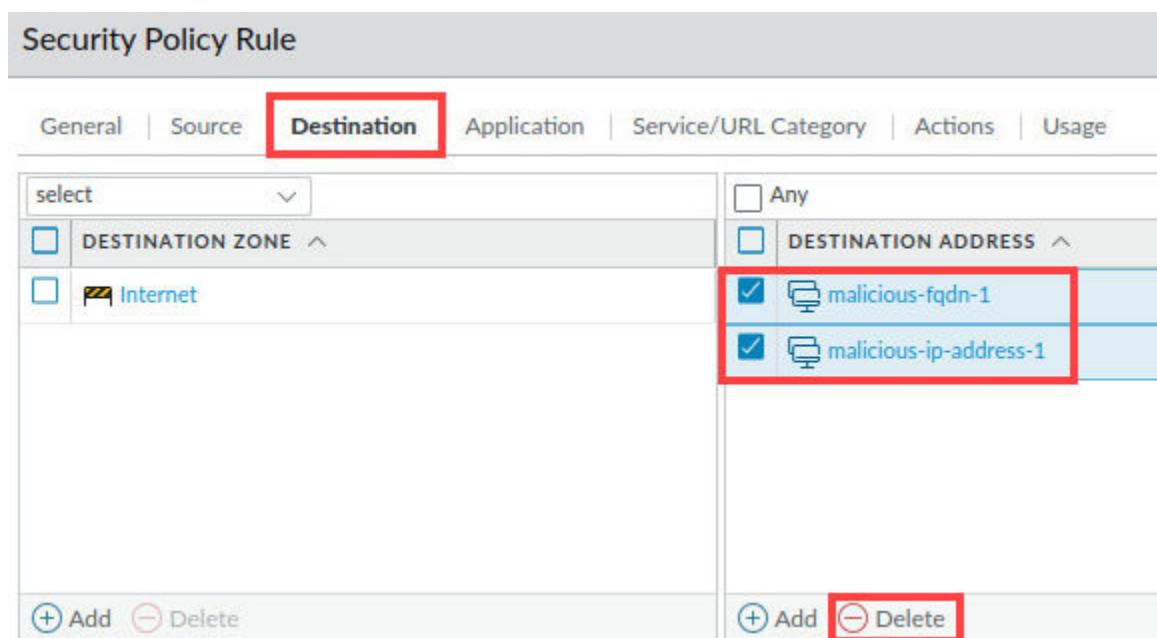
The screenshot shows the 'Address Group' configuration window. The 'Name' field is set to 'Malicious-IP-Group' and the 'Description' field is set to 'Contains malicious IP Address Objects'. The 'Type' is set to 'Static'. In the 'Addresses' section, there is a list box containing 'malicious-fqdn-1' and 'malicious-ip-address-1', with 'malicious-ip-address-1' checked. Below the list box are buttons for 'Browse', '+ Add' (highlighted with a red box), and 'Delete'. At the bottom of the window are 'OK' and 'Cancel' buttons, with 'OK' highlighted with a red box.

3. Select **Policies > Security**. Click **Block-Known-Bad-IPs** to edit the rule.



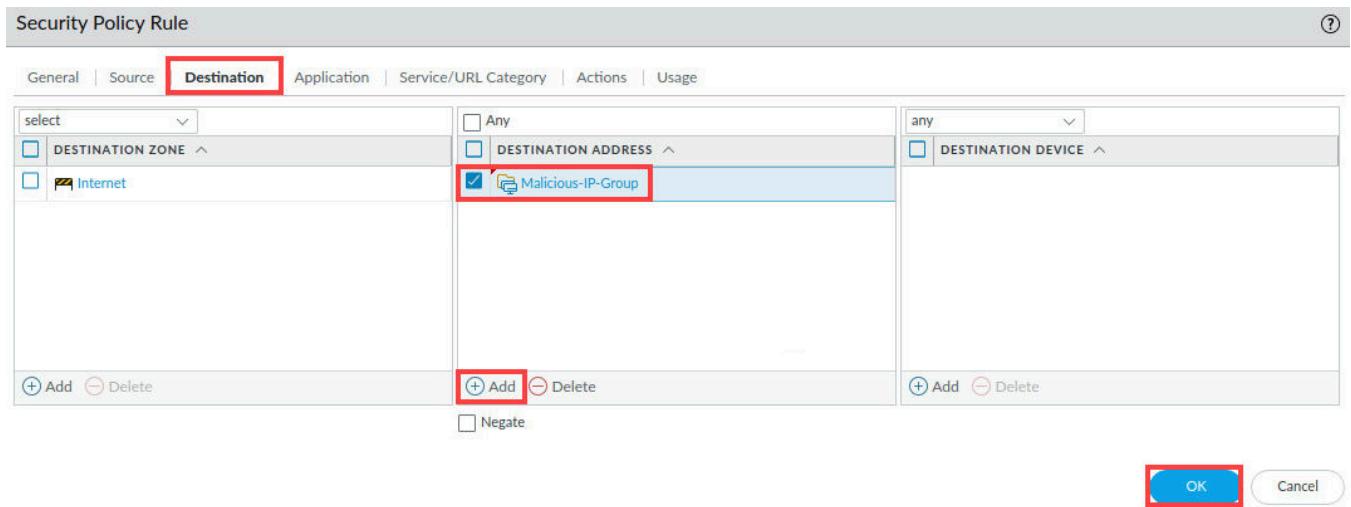
NAME	TAGS	TYPE	ZONE
1 Block-known-Bad-IPs	none	universal	Extranet Users_Net
2 Users_to_Extranet	none	universal	Users_Net

4. In the *Security Policy Rule* window, **Destination** tab, select the **malicious-fqdn-1** and **malicious-ip-address-1** checkboxes. Click **Delete**.



DESTINATION ZONE	DESTINATION ADDRESS
Internet	<input checked="" type="checkbox"/> malicious-fqdn-1 <input checked="" type="checkbox"/> malicious-ip-address-1

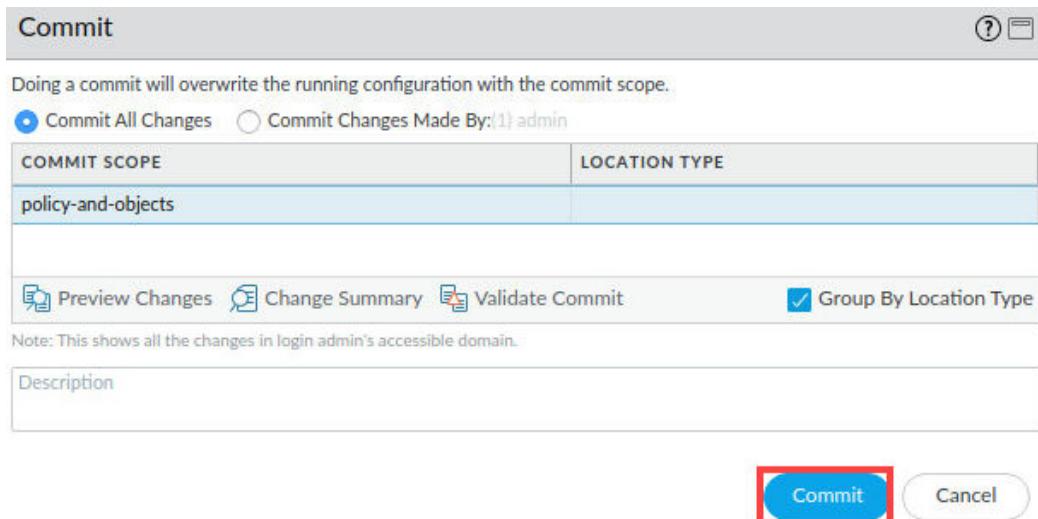
5. In the *Destination Address* window, click **Add**. Select **Malicious-IP-Group**. Click **OK**.



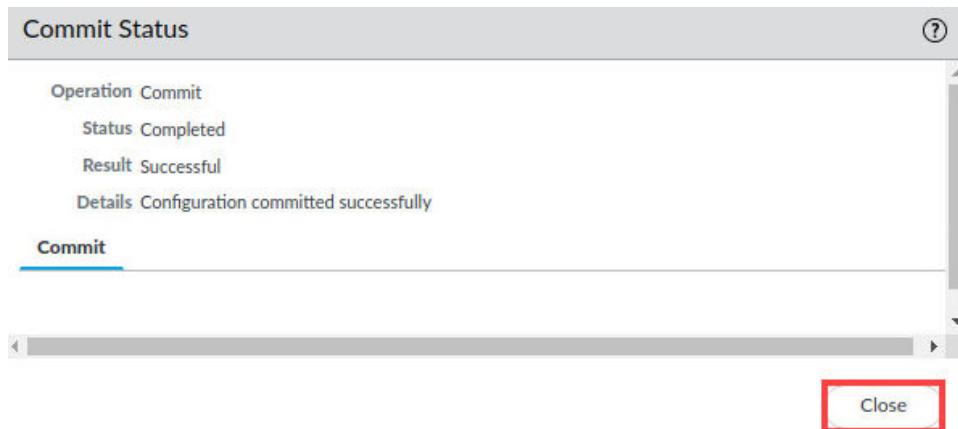
6. Click the **Commit** button at the upper-right of the web interface.



7. In the *Commit* window, click **Commit**.



8. Wait until the *Commit* process is complete. Click **Close**.



9. Minimize the *Chromium* browser by clicking the **minimize** icon and continue to the next task.



10. Return to the *terminal* window by clicking on the **terminal** icon in the taskbar of your *client desktop*.



11. From the *terminal* window on the *desktop*, enter the commands below. Use **Ctrl+C** to stop the ping for the two commands after a few seconds.

```
C:\home\lab-user\Desktop\Lab-Files> ping 2600.org <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping 2600.org
PING 2600.org (166.84.5.162) 56(84) bytes of data.
^C
--- 2600.org ping statistics ---
11 packets transmitted, 0 received, 100% packet loss, time 10227ms
C:\home\lab-user\Desktop\Lab-Files>
```

Please
Note

Pinging 2600.org will fail.

```
C:\home\lab-user\
```

```
C:\home\lab-user\Desktop\Lab-Files> ping www.breakthesecurity.com
PING www.breakthesecurity.com (162.255.119.249) 56(84) bytes of data.
^C
--- www.breakthesecurity.com ping statistics ---
3 packets transmitted, 0 received, 100% packet loss, time 2048ms

C:\home\lab-user\Desktop\Lab-Files>
```

Please Note

Pinging www.breakthesecurity will fail because access to the IP addresses was blocked by the address objects in the security policy.

12. Minimize the *Terminal* window by clicking the **minimize** icon in the upper-right.



13. If you minimized the *firewall*, reopen the *firewall* interface by clicking on the **Chromium** tab in the taskbar. Leave the *firewall* interface open and continue to the next task.



14. Navigate to **Monitor > Logs > Traffic**. Enter the filter (**action eq deny**) in the *filter builder* to look for traffic that has been denied. You should see *additional* entries indicating that your **Block-Known-Bad-IPs** security policy rule has denied traffic to each host.

 A screenshot of the Palo Alto Networks PA-VM interface. The 'MONITOR' tab is selected. In the left sidebar, 'Logs' is expanded, and 'Traffic' is selected. A search bar at the top right contains the filter '(action eq deny)'. The main area is a table of log entries. The columns are: RECEIVE TIME, TYPE, FROM ZONE, TO ZONE, SOURCE, DESTINATION, TO PORT, APPLICATION, ACTION, RULE, and SESSION END REASON. The table shows four entries, all of which are 'drop' type and 'ping' application, with the 'ACTION' column showing 'deny' and the 'RULE' column showing 'Block-known-Bad-IPs'. The 'SESSION END REASON' column shows 'policy-deny' for all entries.

RECEIVE TIME	TYPE	FROM ZONE	TO ZONE	SOURCE	DESTINATION	TO PORT	APPLICATION	ACTION	RULE	SESSION END REASON
08/08 18:48	drop	Users_Net	Internet	192.168.1.20	162.255.119.249	0	ping	deny	Block-known-Bad-IPs	policy-deny
08/08 18:37	drop	Users_Net	Internet	192.168.1.20	166.84.5.162	0	ping	deny	Block-known-Bad-IPs	policy-deny
08/08 17:51:41	drop	Users_Net	Internet	192.168.1.20	162.255.119.249	0	ping	deny	Block-known-Bad-IPs	policy-deny
08/08 17:51:17	drop	Users_Net	Internet	192.168.1.20	162.255.119.249	0	ping	deny	Block-known-Bad-IPs	policy-deny

15. Leave the *Palo Alto Networks Firewall* open and continue to the next task.

7.5 Block Access to Malicious IP Addresses by Geographic Region

You can block access to IP addresses associated with specific geographic regions. This ability is useful for reducing your attack surface by prohibiting traffic from countries where you have no legitimate business contacts.

In this section, you will configure and test access to the blocked geographic region. After you have tested access, you will restore access to the blocked region.

1. Minimize the *Chromium* browser by clicking the **minimize** icon and continue to the next task.



2. Return to the *terminal* window by clicking on the **Terminal** icon in the taskbar of your client desktop.



3. From the *terminal* window on the *desktop*, enter the command below to obtain the IP Address of 2600.org. Write down the **IP address** or **copy** and paste it into a text document on the *desktop*.

```
C:\home\lab-user\Desktop\Lab-Files> nslookup nic.ir <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> nslookup nic.ir
;; Got recursion not available from 192.168.50.53, trying next server
Server:      1.1.1.1
Address:      1.1.1.1#53

Non-authoritative answer:
Name:  nic.ir
Address: 194.225.70.16
;; Got recursion not available from 192.168.50.53, trying next server
C:\home\lab-user\Desktop\Lab-Files>
```

Please
Note

The nic.ir domain is in Iran.

4. In the same **CMD** window, verify connectivity to **nic.ir** by entering the command below. Use **Ctrl+C** to stop the ping after a few seconds.

```
C:\home\lab-user\Desktop\Lab-Files> ping nic.ir <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping nic.ir
PING nic.ir (194.225.70.16) 56(84) bytes of data.
64 bytes from 194.225.70.16 (194.225.70.16): icmp_seq=1 ttl=45 time=230 ms
64 bytes from 194.225.70.16 (194.225.70.16): icmp_seq=2 ttl=45 time=228 ms
64 bytes from 194.225.70.16 (194.225.70.16): icmp_seq=3 ttl=45 time=230 ms
^C
--- nic.ir ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2117ms
rtt min/avg/max/mdev = 228.879/229.995/230.702/0.798 ms
C:\home\lab-user\Desktop\Lab-Files>
```

Please
Note

You may not get a response to the ping but that will not affect this lab.

5. Minimize the *Terminal* window by clicking the **minimize** icon in the upper-right.



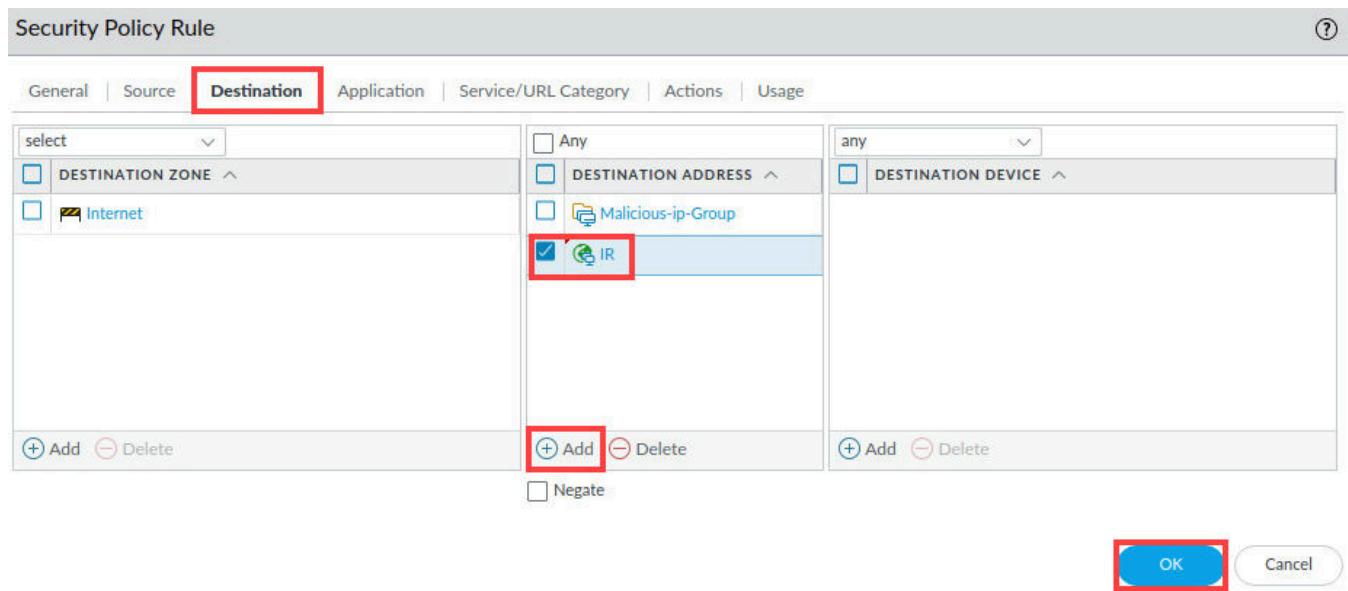
6. If you minimized the *Firewall*, reopen the *Firewall* interface by clicking on the **Chromium** tab in the taskbar.



7. In the web interface, select **Policies > Security**. Click **Block-Known-Bad-IPs** to edit the rule.

NAME	TAGS	TYPE	ZONE
1 Block-known-Bad-IPs	none	universal	Extranet
2 Users_to_Extranet	none	universal	Users_Net
3 Users_to_Internet	none	universal	Users_Net

8. In the **Security Policy Rule** window, click the **Destination** tab and Add IR to the *Destination Address* list. Click **OK**.



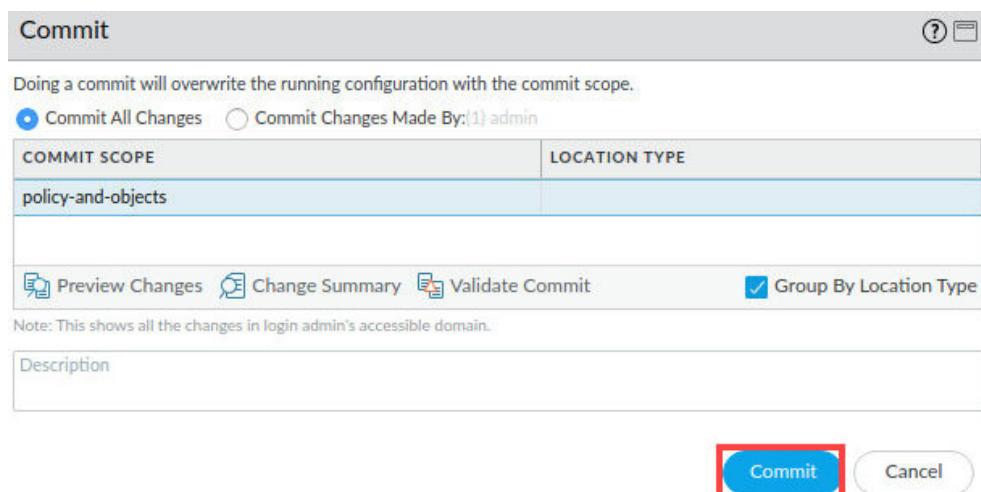
Please Note

You will need to scroll down the list of available addresses to locate the entry for IR.

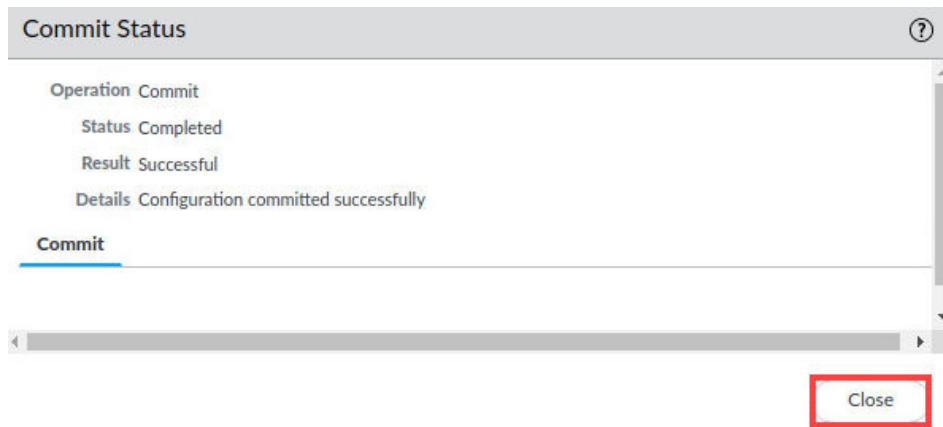
16. Click the **Commit** button at the upper-right of the web interface.



17. In the *Commit* window, click **Commit**.



18. Wait until the *Commit* process is complete. Click **Close**.



19. Minimize the *Chromium* browser by clicking the **minimize** icon and continue to the next task.



20. Return to the *terminal* window by clicking on the **Terminal** icon in the taskbar of your *client desktop*.



21. From the *terminal* window on the *desktop*, verify connectivity to *nic.ir* by entering the command below. Use **Ctrl+C** to stop the ping after a few seconds.

```
C:\home\lab-user\Desktop\Lab-Files> ping nic.ir <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping nic.ir
PING nic.ir (194.225.70.16) 56(84) bytes of data.
^C
--- nic.ir ping statistics ---
28 packets transmitted, 0 received, 100% packet loss, time 27637ms

C:\home\lab-user\Desktop\Lab-Files>
```

Please
Note

The ping will fail because you blocked the region of IR.

22. Minimize the *Terminal* window by clicking the **minimize** icon in the upper-right.



23. If you minimized the *firewall*, reopen the *firewall* interface by clicking on the **Chromium** tab in the taskbar.



24. Navigate to **Monitor > Logs > Traffic**. Enter the filter (`addr.dst in 194.225.70.16`) in the *filter builder* to look for traffic that has been denied. You should see entries indicating that your **Block-Known-Bad-IPs** security policy rule has denied traffic to each host.

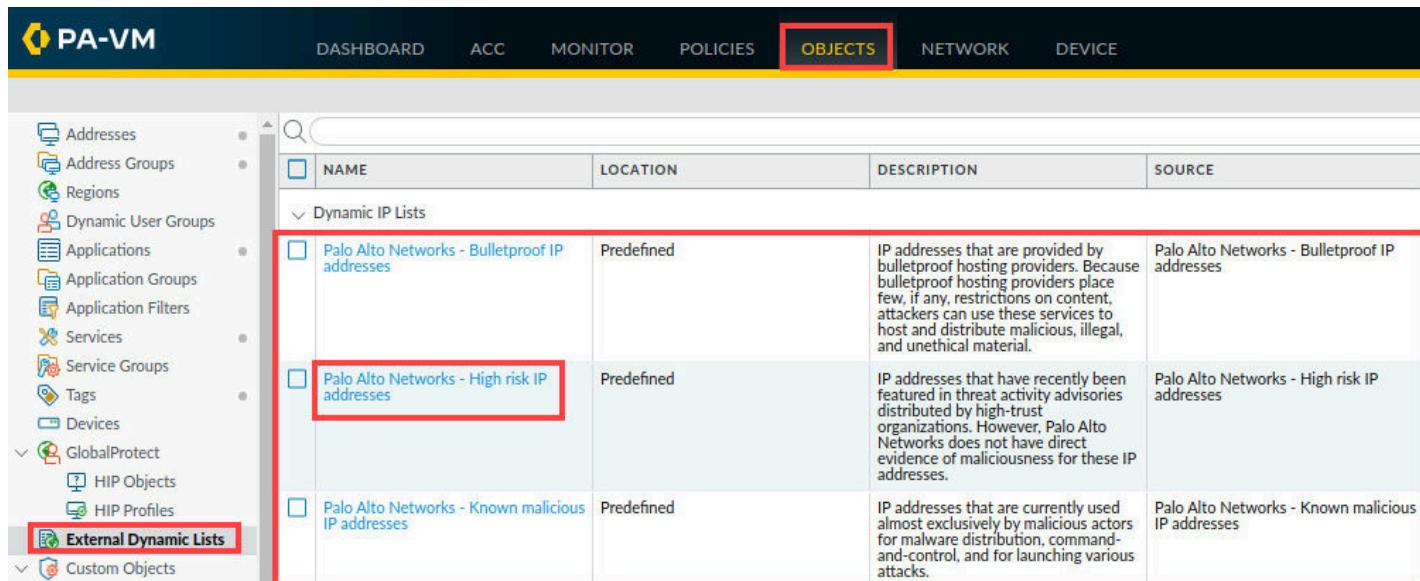
	RECEIVE TIME	TYPE	FROM ZONE	TO ZONE	SOURCE	DESTINATION	TO PORT	APPLICATION	ACTION	RULE	SESSION END REASON
	08/08 18:45:33	drop	Users_Net	Internet	192.168.1.20	194.225.70.16	0	ping	deny	Block-known-Bad-IPs	policy-deny
	08/08 18:45:27	drop	Users_Net	Internet	192.168.1.20	194.225.70.16	0	ping	deny	Block-known-Bad-IPs	policy-deny
	08/08 18:45:21	drop	Users_Net	Internet	192.168.1.20	194.225.70.16	0	ping	deny	Block-known-Bad-IPs	policy-deny
	08/08 18:45:15	drop	Users_Net	Internet	192.168.1.20	194.225.70.16	0	ping	deny	Block-known-Bad-IPs	policy-deny
	08/08 18:45:09	drop	Users_Net	Internet	192.168.1.20	194.225.70.16	0	ping	deny	Block-known-Bad-IPs	policy-deny

25. Leave the *Palo Alto Networks Firewall* open and continue to the next task.

7.6 Block Access to Malicious IP Addresses Using EDLs

You can add a list of malicious IP addresses to a file on an external web server and configure the firewall to access the list as an EDL. The advantage of this approach is that the malicious IP address list can be regularly updated without the need to recommit the firewall configuration, as you would have to do if you updated an Address object or Address Group. EDLs simplify the maintenance of a current list of IP addresses.

- In the *firewall* interface, select **Objects > External Dynamic Lists**. Note the three predefined EDLs contain known malicious and high-risk IP address lists. Click **Palo Alto Networks – High risk IP addresses**.



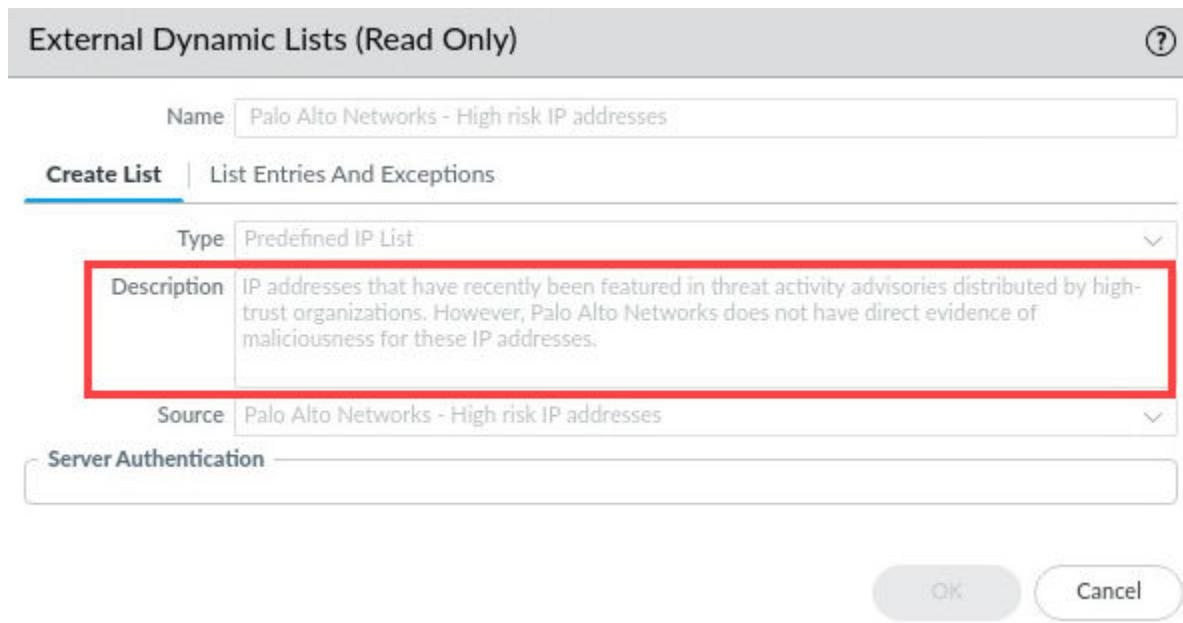
The screenshot shows the 'External Dynamic Lists' page in the Palo Alto Networks firewall interface. The 'OBJECTS' tab is selected. A red box highlights the 'Palo Alto Networks - High risk IP addresses' list. The table displays three predefined lists:

NAME	LOCATION	DESCRIPTION	SOURCE
Palo Alto Networks - Bulletproof IP addresses	Predefined	IP addresses that are provided by bulletproof hosting providers. Because bulletproof hosting providers place few, if any, restrictions on content, attackers can use these services to host and distribute malicious, illegal, and unethical material.	Palo Alto Networks - Bulletproof IP addresses
Palo Alto Networks - High risk IP addresses	Predefined	IP addresses that have recently been featured in threat activity advisories distributed by high-trust organizations. However, Palo Alto Networks does not have direct evidence of maliciousness for these IP addresses.	Palo Alto Networks - High risk IP addresses
Palo Alto Networks - Known malicious IP addresses	Predefined	IP addresses that are currently used almost exclusively by malicious actors for malware distribution, command-and-control, and for launching various attacks.	Palo Alto Networks - Known malicious IP addresses

Please Note

Palo Alto Networks maintains and provides these lists.

- Read the description of the list.



The screenshot shows the 'External Dynamic Lists (Read Only)' dialog box. The 'Name' field is set to 'Palo Alto Networks - High risk IP addresses'. The 'Type' field is set to 'Predefined IP List'. The 'Description' field contains the following text, which is highlighted with a red box:

IP addresses that have recently been featured in threat activity advisories distributed by high-trust organizations. However, Palo Alto Networks does not have direct evidence of maliciousness for these IP addresses.

The 'Source' field is set to 'Palo Alto Networks - High risk IP addresses'. The 'Server Authentication' field is empty. At the bottom are 'OK' and 'Cancel' buttons.

3. Click the **List Entries And Exceptions** tab. Write down *three IP addresses* on the current list of IP addresses. You will try to **ping** these addresses later in this lab exercise. Click **Cancel**.

The screenshot shows the 'External Dynamic Lists (Read Only)' window. The 'List Entries And Exceptions' tab is selected. The 'List Entries' section contains a list of IP addresses. The first three entries (89.37.192.194, 80.211.52.246, 185.232.64.32) are highlighted with a red box. The 'Manual Exceptions' section is empty. At the bottom, there are 'OK' and 'Cancel' buttons, with 'Cancel' highlighted with a red box.

Please Note

For this step, we chose the first three IP Addresses on the list. You may choose any IP Addresses you would like however, it is important to write down the IP Address to complete this task.

Note that you can also copy and paste these addresses into a text file on the client desktop.

4. At the bottom of the *External Dynamic Lists* window, click **Add**.



5. In the *External Dynamic Lists* window, create another **EDL** and configure the following. Click **Test Source URL**.

Parameter	Value
Name	custom-malicious-ips-edl
Type	IP List
Description	Contains manually entered IP address list on web server.
Source	http://192.168.50.80/malicious-ips.txt (The EDL contains only the IP address 192.168.50.11.)
Check for updates	Five Minute

External Dynamic Lists

Name

Type

Description

Source

Server Authentication

Certificate Profile

Check for updates

6. The firewall should present a *Test Source URL* window indicating that it can access the URL. Click **Close**.

Test Source URL

Source URL is accessible.

7. Click **OK** in the *External Dynamic Lists* window.

External Dynamic Lists

Name:

Create List | List Entries And Exceptions

Type:

Description: Contains manually entered IP address list on web server

Source:

Server Authentication

Certificate Profile:

Check for updates:

Test Source URL **OK** **Cancel**

8. Update the security policy to include *External Dynamic Lists*. Navigate to **Policies > Security**. Click **Block-Known-Bad-IPs** to edit the rule.

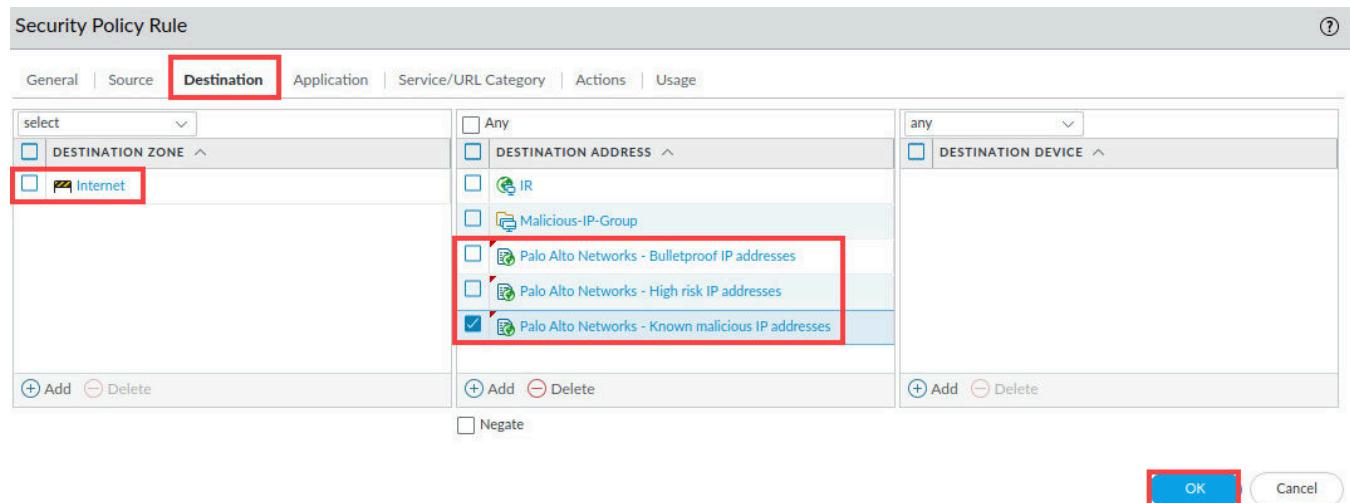
PA-VM DASHBOARD ACC MONITOR **POLICIES** OBJECTS

Security

NAME	TAGS	TYPE	ZONE	AD
1 Block-known-Bad-IPs	none	universal	Extranet	an
2 Users_to_Extranet	none	universal	Users_Net	an

9. Click the **Destination** tab and configure the following. Click **OK**.

Parameter	Value
Destination Zone	Internet
Destination Address	Add the following to the list: Palo Alto Networks – Bulletproof IP addresses Palo Alto Networks – High risk IP addresses Palo Alto Networks – Known malicious IP addresses



Please Note

The “Block-Known-Bad-IPs” rule now is configured to block access to the three IP addresses you wrote down in lab Step 3.

10. Click **Users_to_Extranet** to edit the rule.

NAME	TAGS	TYPE	ZONE	ADDRESS
			Extranet	any
1 Block-known-Bad-IPs	none	universal	Extranet	any
2 Users_to_Extranet	none	universal	Users_Net	any
3 Users_to_Internet	none	universal	Users_Net	any
4 Extranet_to_Internet	none	universal	Extranet	any

11. In the *Security Policy Rule* window, click the **Destination** tab and configure the following. Click **OK**.

Parameter	Value
Destination Zone	Extranet
Destination Address	custom-malicious-ips-edl
Negate	Select check box

The screenshot shows the 'Security Policy Rule' configuration window. The 'Destination' tab is selected. In the 'DESTINATION ZONE' section, 'Extranet' is selected. In the 'DESTINATION ADDRESS' section, 'custom-malicious-ips-edl' is selected. The 'Negate' checkbox is checked. The 'OK' button is highlighted with a red box.

Please Note

The malicious-ips-edl EDL contains the IP address of a host in the Extranet zone (192.168.50.11). When the destination address is used in conjunction with the Negate option, the rule matches and allows any address in the Extranet zone except the address listed in the EDL.

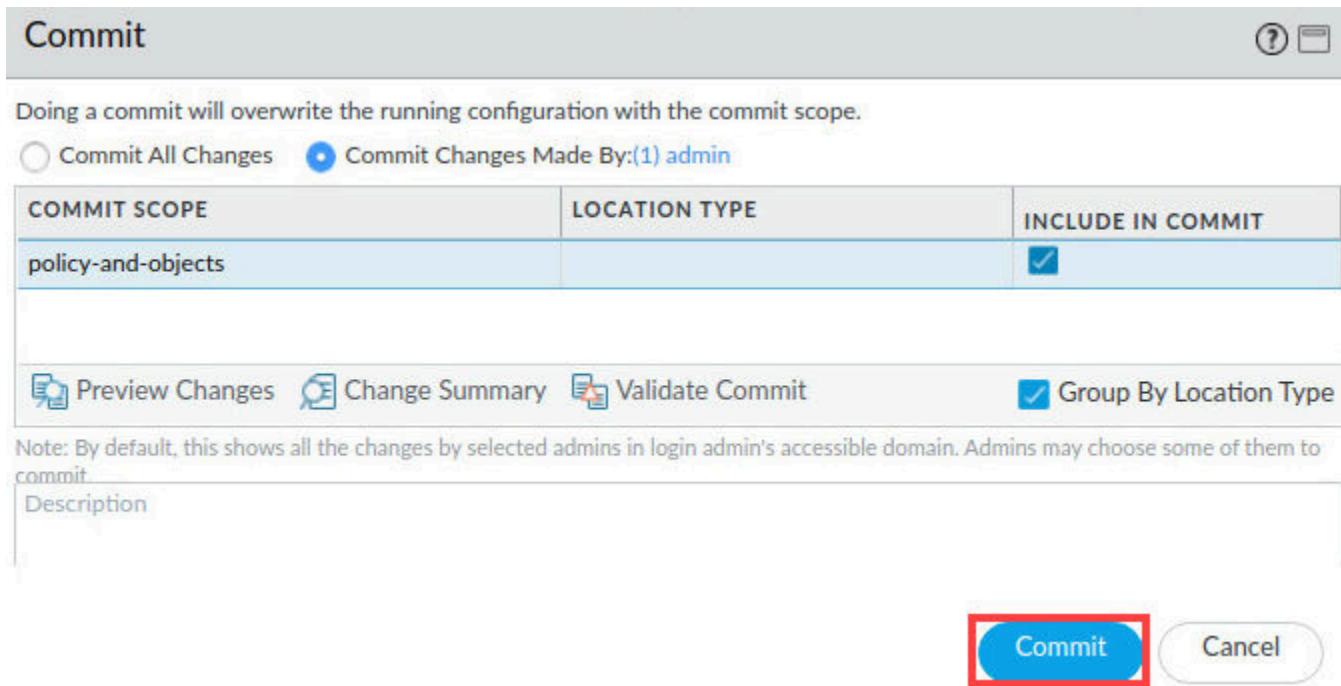
12. Notice in the *Users_to_Extranet* rule that *custom-malicious-ips-edl* has a line through it. This line indicates that the **Negate** option has been employed for addresses in the list.

NAME	TAGS	TYPE	Source					Destination	
			ZONE	ADDRESS	USER	DEVICE	ZONE	ADDRESS	
1	Block-known-Bad-IPs	none	universal	Extranet	any	any	any	Internet	IR
				Users_Net					Malicious-IP-Group
									Palo Alto Networks - Bulletproof IP ...
									Palo Alto Networks - High risk IP ad...
									Palo Alto Networks - Known malicio...
2	Users_to_Extranet	none	universal	Users_Net	any	any	any	Extranet	custom-malicious-ips-edl
3	Users_to_Internet	none	universal	Users_Net	any	any	any	Internet	any

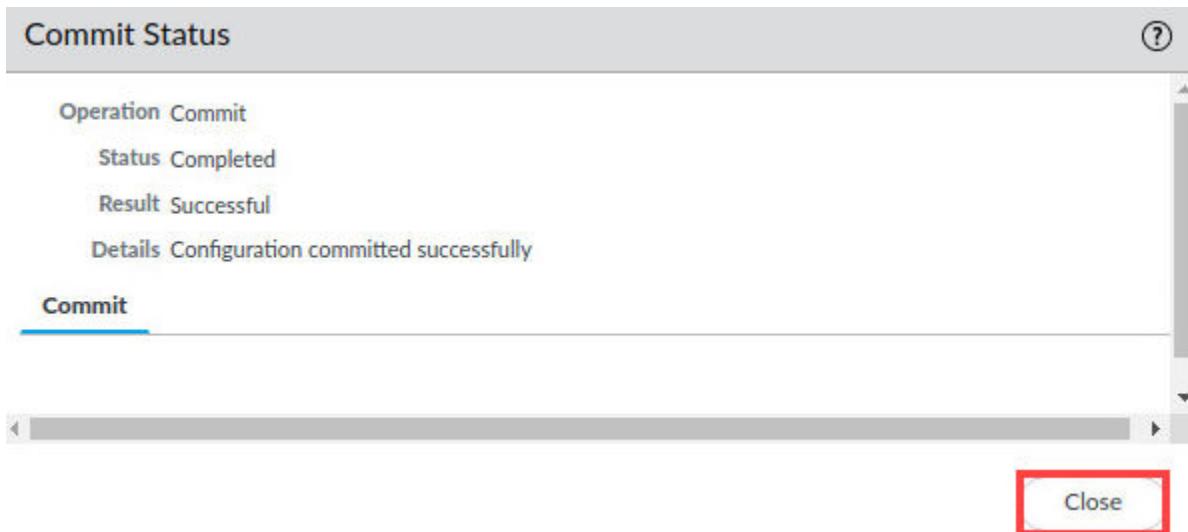
13. Click the **Commit** button at the upper-right of the web interface.



14. In the *Commit* window, click **Commit**.



15. Wait until the *Commit* process is complete. Click **Close**.



16. Return to the *terminal* window by clicking on the **Terminal** icon in the taskbar of your *client desktop*.



17. From the *terminal* window on the *desktop*, ping an address on the internet by issuing the following command.

```
C:\home\lab-user\Desktop\Lab-Files> ping 192.168.50.11 <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping 192.168.50.11
```

18. After a few seconds, use **Ctrl+C** to stop the connection because it will not succeed.

```
C:\home\lab-user\Desktop\Lab-Files> ping 192.168.50.11
PING 192.168.50.11 (192.168.50.11) 56(84) bytes of data.
^C
--- 192.168.50.11 ping statistics ---
4 packets transmitted, 0 received, 100% packet loss, time 3065ms

C:\home\lab-user\Desktop\Lab-Files>
```

Please
Note

The **ping** should fail because the IP address is listed in the custom EDL.

19. From the *terminal* window, use **ping** again, but this time try one of the three IP addresses that you wrote down earlier in lab step 3.

```
C:\home\lab-user\Desktop\Lab-Files> ping 89.37.192.194 <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping 89.37.192.194
```

20. After a few seconds, use **Ctrl+C** to stop the connection because it will not succeed.

```
C:\home\lab-user\Desktop\Lab-Files> ping 89.37.192.194
PING 89.37.192.194 (89.37.192.194) 56(84) bytes of data.
^C
--- 89.37.192.194 ping statistics ---
3 packets transmitted, 0 received, 100% packet loss, time 2036ms

C:\home\lab-user\Desktop\Lab-Files>
```

Please
Note

These IP addresses were in one of the EDLs predefined by Palo Alto Networks.

21. Minimize the *Terminal* window open on the client because you will perform this same task in a later step.



22. If you minimized the *Firewall*, reopen the *Firewall* interface by clicking on the **Chromium** tab in the taskbar.



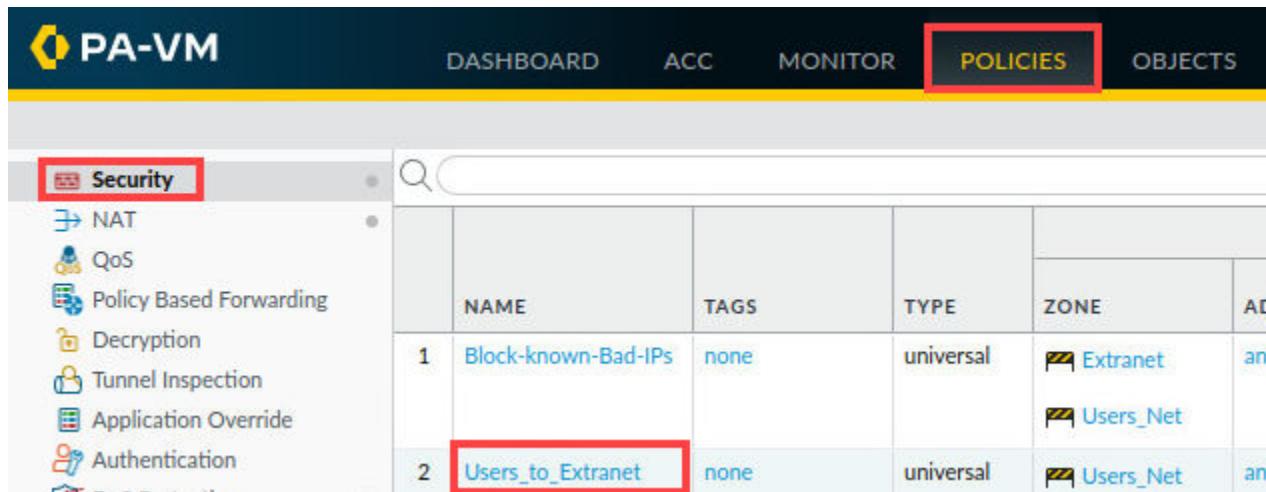
23. Examine the traffic log again and use a simple filter to see if there are any entries for this session that failed. Navigate to **Monitor > Logs > Traffic**. In the filter field, enter (`action neq allow`) and (`app eq ping`). Click the **Apply Filter** button in the upper-right corner of the window. You will notice the firewall is now logging entries matching your filter.

	RECEIVE TIME	TYPE	FROM ZONE	TO ZONE	SOURCE	DESTINATION	TO PORT	APPLICATION	ACTION	RULE	SESSION END REASON
	08/08 19:30:02	drop	Users_Net	Internet	192.168.1.20	89.37.192.194	0	ping	deny	Block-known-Bad-IPs	policy-deny
	08/08 19:25:49	drop	Users_Net	Extranet	192.168.1.20	192.168.50.11	0	ping	deny	interzone-default	policy-deny
	08/08 18:45:33	drop	Users_Net	Internet	192.168.1.20	194.225.70.16	0	ping	deny	Block-known-Bad-IPs	policy-deny
	08/08 18:45:27	drop	Users_Net	Internet	192.168.1.20	194.225.70.16	0	ping	deny	Block-known-Bad-IPs	policy-deny

Please Note

Note that ping to 192.168.50.11 hit the **interzone-default** rule and not the **Users_to_Extranet** rule. The **Users_to_Extranet** rule is set to allow traffic (with the exception of the IP address 192.168.50.11). Traffic to the 192.168.50.11 address does not match the rule because of the **negate** setting you applied in the Destination Address section. However, that traffic does match the **interzone-default** rule which denies traffic.

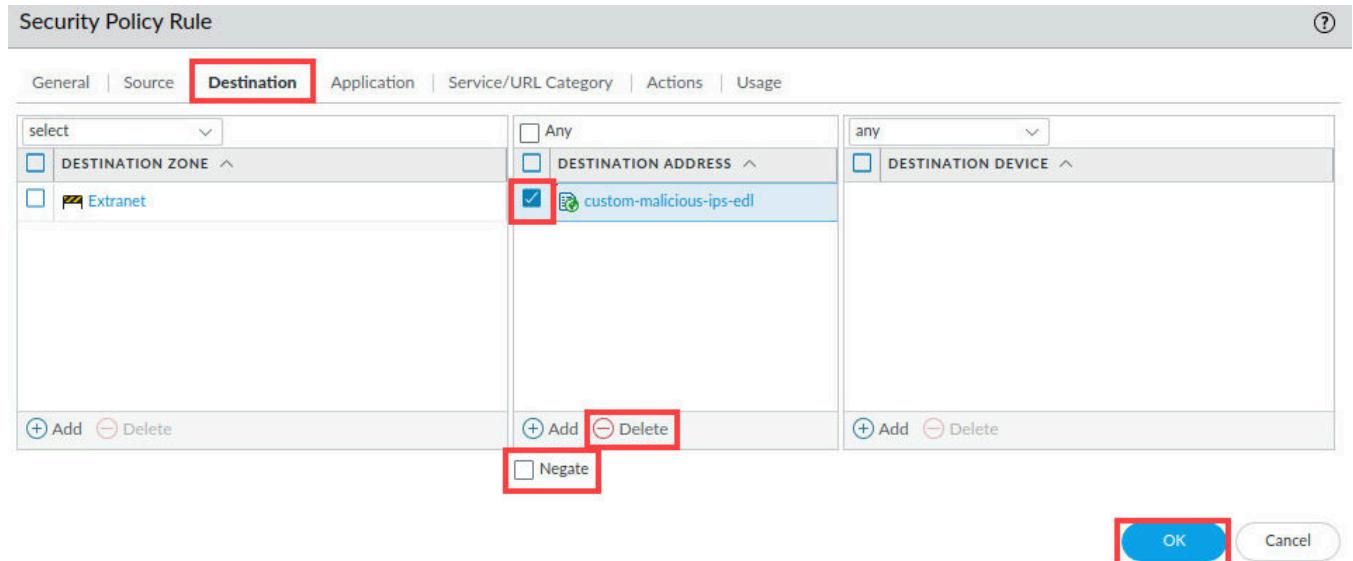
24. In the firewall web interface, select **Policies > Security**. Click **Users_to_Extranet** to edit the rule.



NAME	TAGS	TYPE	ZONE	AD
1 Block-known-Bad-IPs	none	universal	Extranet	an
2 Users_to_Extranet	none	universal	Users_Net	an

25. In the *Security Policy Rule* window, click the **Destination** tab and configure the following. Click **OK**.

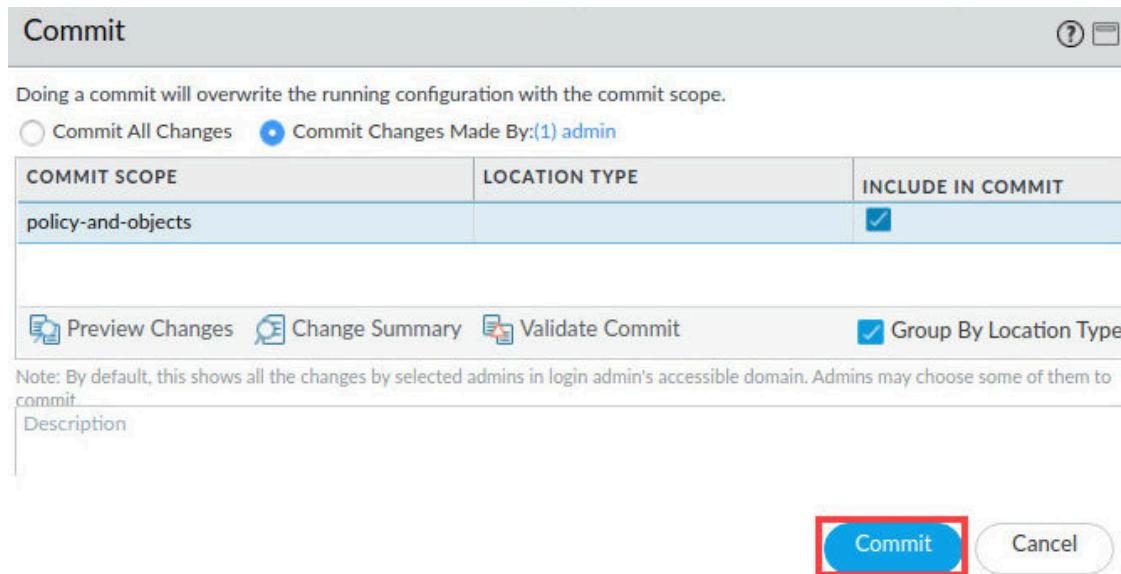
Parameter	Value
Destination Zone	Extranet
Destination Address	Delete custom-malicious-ips-edl
Negate check box	Deselect it



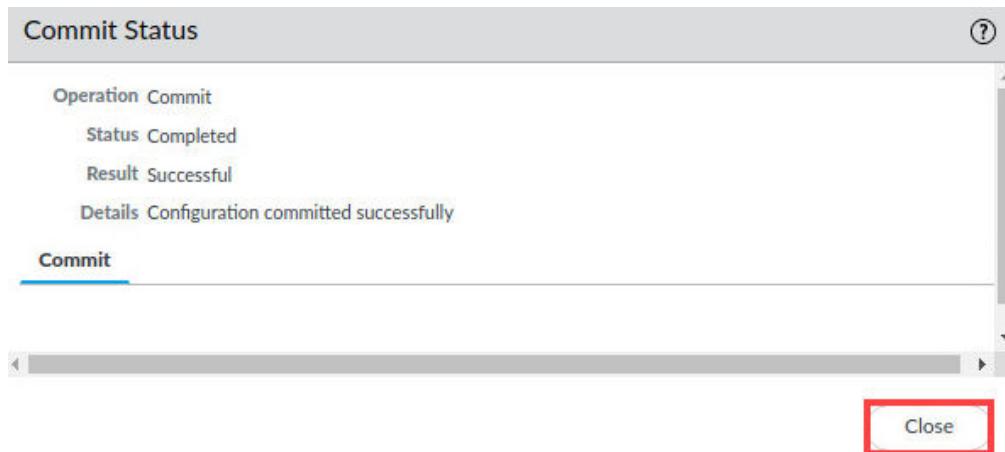
26. Click the **Commit** button at the upper-right of the web interface.



27. In the *Commit* window, click **Commit**.



28. Wait until the *Commit* process is complete. Click **Close**.



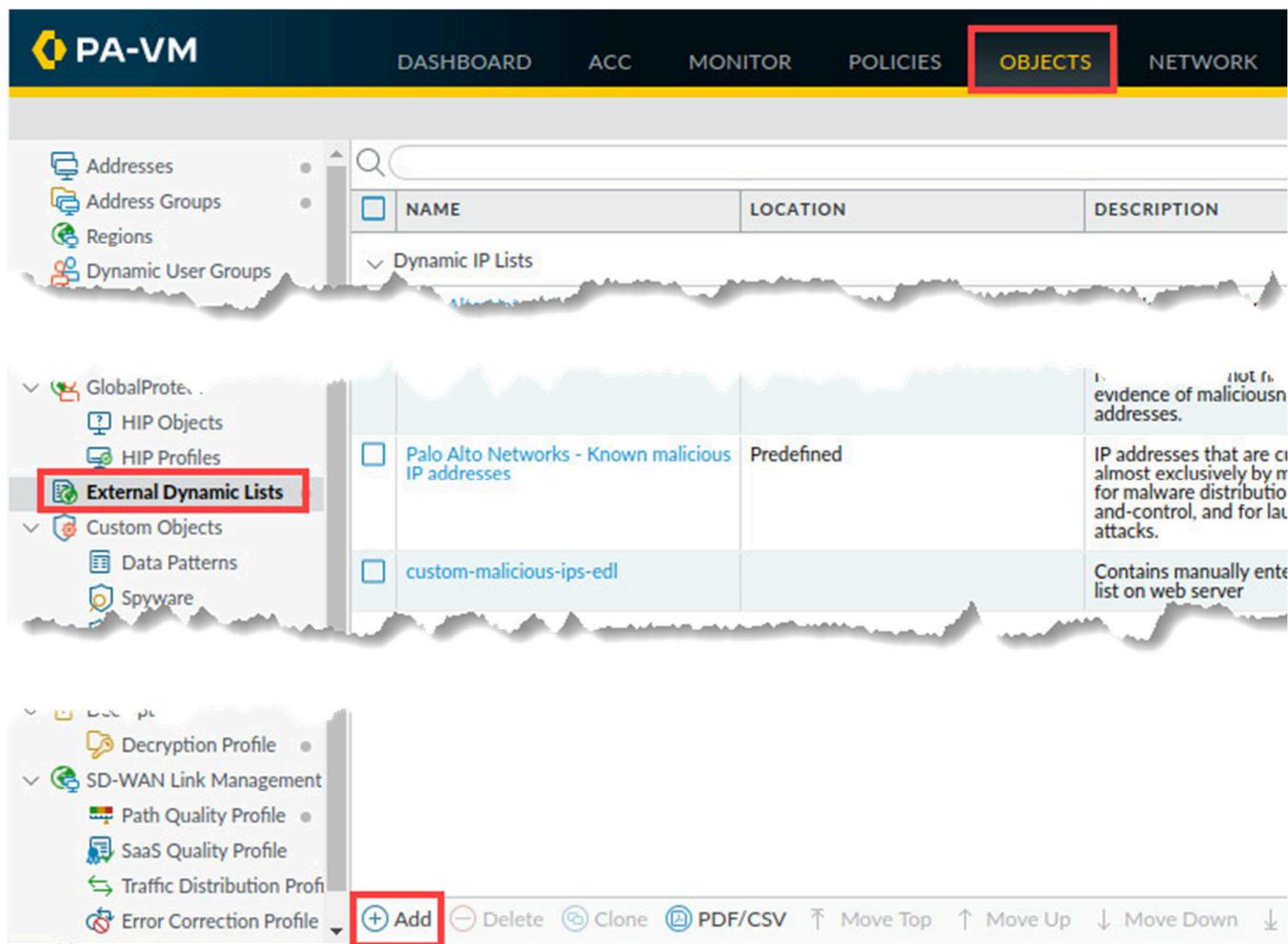
29. Leave the web interface open and continue to the next task.

7.7 Block Access to Malicious Domains Using an EDL

You can add a list of malicious domains to a file on an external web server and then configure the firewall to access the list as an EDL. The advantage of this approach is that the malicious domain list can be updated regularly without the need to recommit the firewall configuration.

In this section, you will block access to malicious domains using an External Dynamic List.

1. In the *PA-VM firewall* web interface, navigate to **Objects > External Dynamic Lists**. Click **Add** at the bottom of the window.



PA-VM

DASHBOARD ACC MONITOR POLICIES **OBJECTS** NETWORK

Addresses Address Groups Regions Dynamic User Groups

NAME LOCATION DESCRIPTION

Dynamic IP Lists

GlobalProtect Objects

- HIP Objects
- HIP Profiles
- External Dynamic Lists**

Custom Objects

- Data Patterns
- Spyware

Decryption Profile

SD-WAN Link Management

- Path Quality Profile
- SaaS Quality Profile
- Traffic Distribution Profile
- Error Correction Profile

Add

NAME	LOCATION	DESCRIPTION
Palo Alto Networks - Known malicious IP addresses	Predefined	IP addresses that are almost exclusively used for malware distribution and control, and for launching attacks.
custom-malicious-ips-edl		Contains manually entered list on web server

2. In the *External Dynamic Lists* window, configure the following. Click **OK**.

Parameter	Value
Name	malicious-domains-edl
Type	Domain List
Source	<p>http://192.168.50.80/malicious-domains.txt</p> <p>(The EDL contains the domains quora.com and producthunt.com.)</p>
Automatically expand to include subdomains	Select it
Check for updates	Five Minute

External Dynamic Lists

Name **malicious-domains-edl**

Type **Domain List**

Description

Source <http://192.168.50.80/malicious-domains.txt>

Automatically expand to include subdomains

Server Authentication

Certificate Profile **None**

Check for updates **Five Minute**

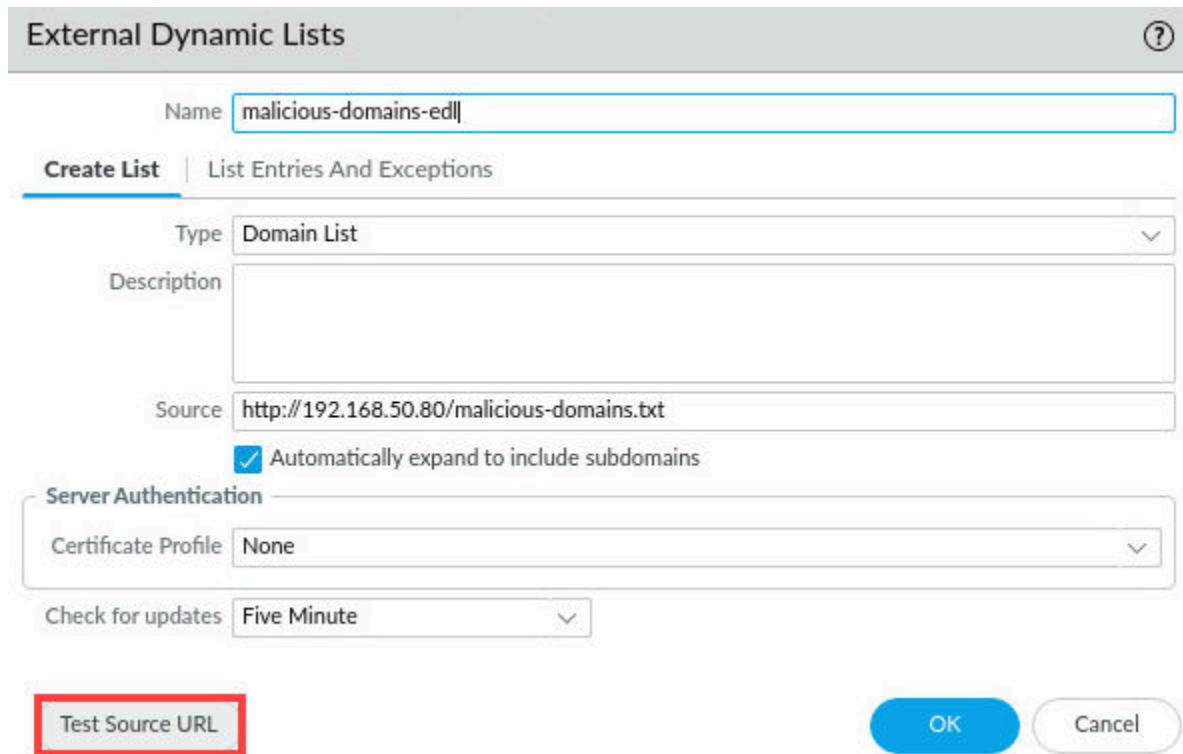
OK **Cancel**

Please Note This EDL will be used to block access to the quora.com and producthunt.com domains.

3. Click to reopen the **malicious-domains-edl**.



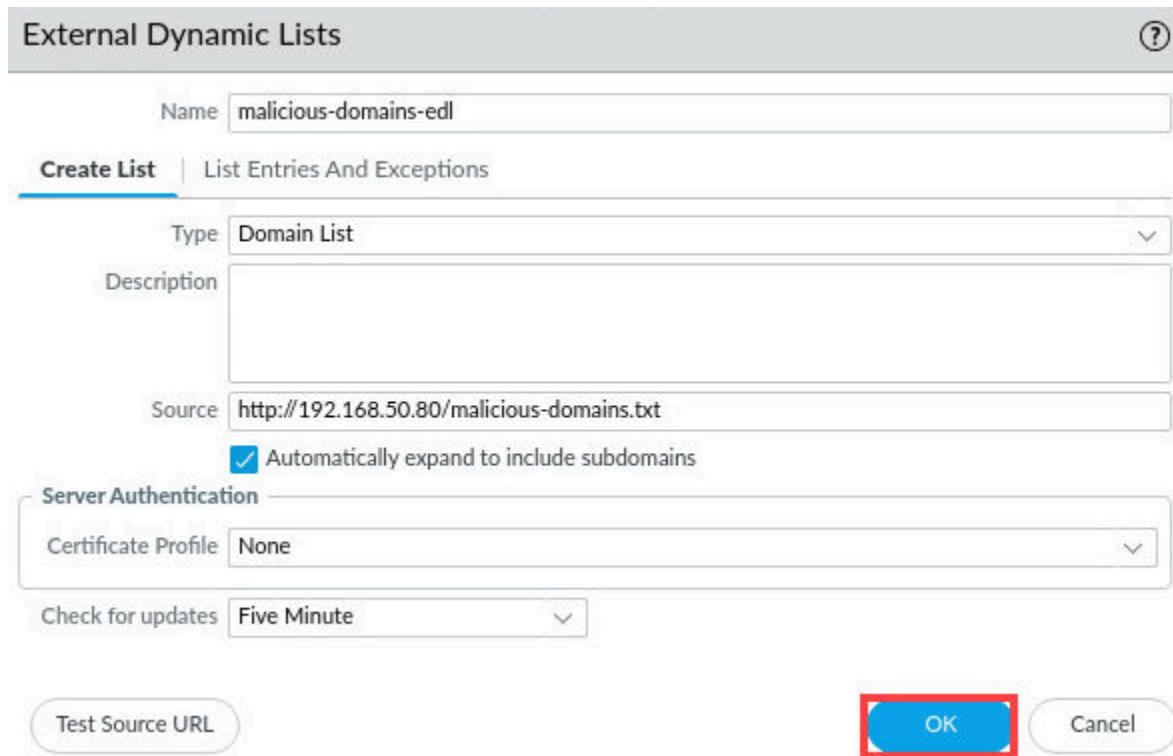
4. In the *External Dynamic Lists* window, click **Test Source URL**.



5. The firewall should present a **Test Source URL** window indicating that it can access the URL. Click **Close**.



6. Click **OK** in the *External Dynamic Lists* window.



7. Leave the firewall open and continue to the next task.

7.8 Add the Domain List EDL to an Anti-Spyware Profile

You can add an EDL containing a domain list to an Anti-Spyware Profile to block access to malicious domains. You must attach the Anti-Spyware Profile to a security policy rule that allows network access. Although the security policy rule might allow the traffic, the attached Anti-Spyware Profile will block access to any domains listed in the EDL.

In this section, you will add a domain list EDL to an anti-spyware profile.

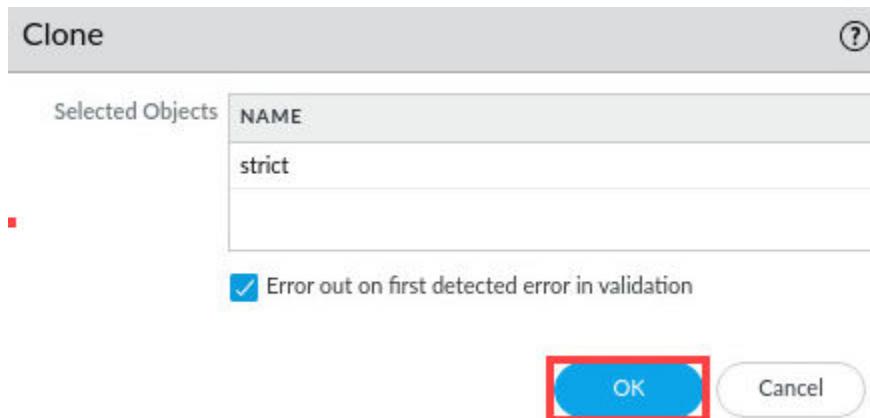
1. In the web interface, select **Objects > Security Profiles > Anti-Spyware**. Select the checkbox next to the **strict Anti-Spyware Profile**. Click **Clone**.

The screenshot shows the PA-VM web interface with the following sections:

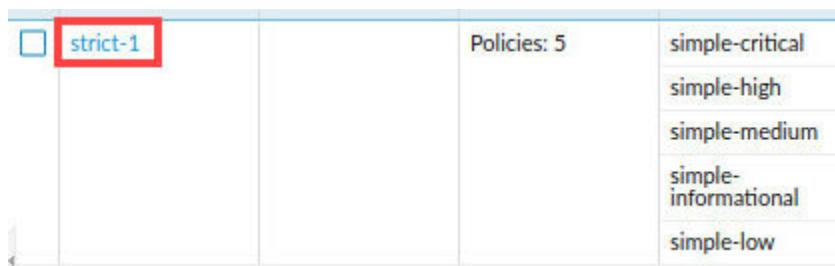
- Header:** PA-VM, DASHBOARD, ACC, MONITOR, POLICIES, **OBJECTS** (highlighted with a red box), NETWORK.
- Left Sidebar:** Addresses, Address Groups, Regions, Dynamic User Groups, Applications, Application Groups, Application Filters, Services, Service Groups, Tags, Devices, GlobalProtect, HIP Objects.
- Table:** Shows security profiles. The "strict" profile is selected (checkbox checked, highlighted with a red box).

NAME	LOCATION	COUNT	POLICY NAME	THREAT NAME
default	Predefined	Policies: 4	simple-critical simple-high simple-medium simple-low	any
strict	Predefined	Policies: 5	simple-critical simple-high simple-medium simple-informational	any
- Left Sidebar (Security Profiles):** spyware, Vulnerability, URL Category, **Security Profiles** (highlighted with a red box), Antivirus, **Anti-Spyware** (highlighted with a red box), Vulnerability Protection, URL Filtering.
- Bottom Bar:** Path Quality Profile, SaaS Quality Profile, Traffic Distribution Profile, Add, Delete, **Clone** (highlighted with a red box), PDF/CSV.

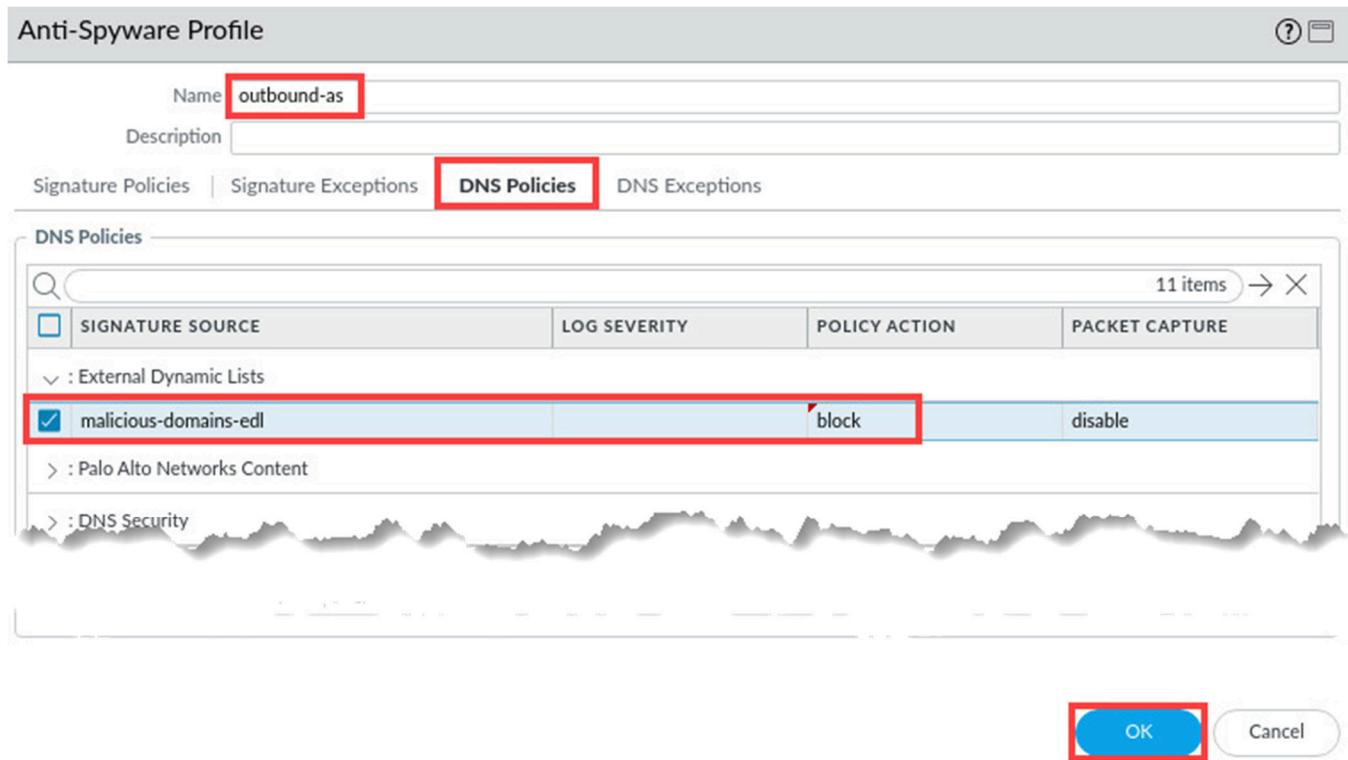
2. In the *Clone* window, click **OK**.



3. A new **strict-1** Anti-Spyware Profile should have been created. Click **strict-1** to edit the profile.



4. Rename the profile **outbound-as**. Click the **DNS Policies** tab. Under the *External Dynamic Lists* section, change the **Policy Action** dropdown list to **block**. Click **OK**.



Please Note

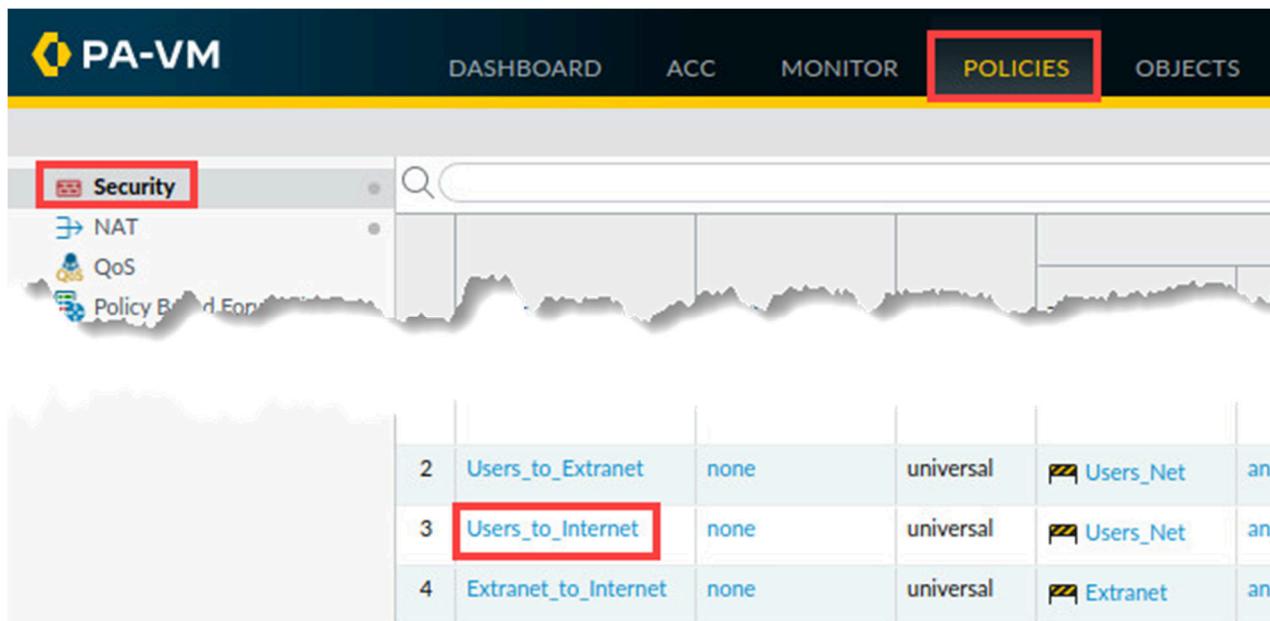
Palo Alto Networks typically recommends the “sinkhole” action, which will be discussed and used in another lab exercise.

5. Leave the firewall open and continue to the next task.

7.9 Add the Anti-Spyware Profile to a Security Policy Rule

In this section, you will add the **outbound-as** Anti-Spyware Profile to the security policy. The configuration of the profile will enable the firewall to use malicious domain signatures to block access to malicious domains.

1. In the web interface, navigate to **Policies > Security**. Click **Users_to_Internet** to edit the rule.



2	Users_to_Extranet	none	universal	Users_Net	any	
3	Users_to_Internet	none	universal	Users_Net	any	
4	Extranet_to_Internet	none	universal	Extranet	any	

2. In the *Security Policy Rule* window, configure the following on the **Actions** tab. Click **OK**.

Parameter	Value
Profile Type	Profiles
Anti-Spyware	outbound-as

Security Policy Rule

General | Source | Destination | Application | Service/URL Category | **Actions** | Usage

Action Setting

Action: Allow Send ICMP Unreachable

Profile Setting

Profile Type: Profiles

Antivirus: None

Vulnerability Protection: None

Anti-Spyware: **outbound-as**

URL Filtering: None

File Blocking: None

Data Filtering: None

WildFire Analysis: None

Log Settings

OK Cancel

3. Click the **Commit** button at the upper-right of the web interface.



4. In the *Commit* window, click **Commit**.

5. Wait until the *Commit* process is complete. Click **Close**.

6. Minimize the *Chromium* browser by clicking the **minimize** icon.



7. Return to the *terminal* window by clicking on the **terminal** icon in the taskbar of your *client desktop*.



8. From the *terminal* window on the *desktop*, ping two addresses on the internet by issuing the following commands. Use **Ctrl+C** to stop the ping for the two commands after a few seconds.

```
C:\home\lab-user\Desktop\Lab-Files> ping quora.com <Enter>
```

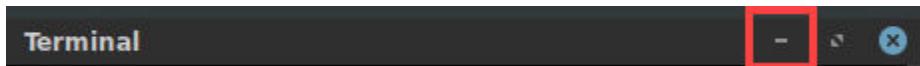
```
C:\home\lab-user\Desktop\Lab-Files> ping producthunt.com <Enter>
```

```
C:\home\lab-user\Desktop\Lab-Files> ping quora.com
^C
C:\home\lab-user\Desktop\Lab-Files> ping producthunt.com
^C
C:\home\lab-user\Desktop\Lab-Files> 
```

Please
Note

The ping commands should fail because the domains are listed in the custom EDL and the custom EDL was added to the outbound-as Anti-Spyware Profile and configured with the “block” action.

9. Minimize the *Terminal* window.



10. If you minimized the *firewall*, reopen the *firewall* interface by clicking on the **Chromium** tab in the taskbar.



11. Examine the firewall traffic log by ensuring you are at **Monitor > Logs > Threat**. Clear any *filters* in filter builder. You should see several entries indicating that the firewall has blocked DNS queries for the hosts listed in the **malicious-domains-edl**.

	RECEIVE TIME	TYPE	THREAT ID/NAME	FROM ZONE	TO ZONE	SOURCE ADDRESS	DESTINATION ADDRESS	TO PORT	APPLICATION	ACTION	SEVERITY	URL
1	08/08 20:53:02	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	8.8.8.8	53	dns	drop	medium	quora.com
2	08/08 20:52:59	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	1.1.1.1	53	dns	drop	medium	quora.com
3	08/08 20:52:40	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	8.8.8.8	53	dns	drop	medium	producthunt.com
4	08/08 20:52:37	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	1.1.1.1	53	dns	drop	medium	producthunt.com
5	08/08 20:46:23	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	8.8.8.8	53	dns	drop	medium	producthunt.com
6	08/08 20:46:20	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	1.1.1.1	53	dns	drop	medium	producthunt.com
7	08/08 20:46:03	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	8.8.8.8	53	dns	drop	medium	quora.com
8	08/08 20:46:00	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	1.1.1.1	53	dns	drop	medium	quora.com
9	08/08 20:45:56	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	8.8.8.8	53	dns	drop	medium	quora.com
10	08/08 20:45:53	spyware	malicious-domains-edl	Users_Net	Internet	192.168.1.20	1.1.1.1	53	dns	drop	medium	quora.com

Please Note

The order of columns has been rearranged and several columns have been hidden in the example above.

12. Minimize the *Chromium* browser by clicking the **minimize** icon and continue to the next task.



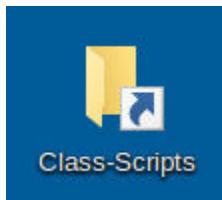
7.10 Block Access to Malicious URLs Using the Security Policy

In this section, you will block access to known-malicious URLs by configuring the firewall's URL Filtering feature. You will add URL categories to a security policy rule configured to block traffic.

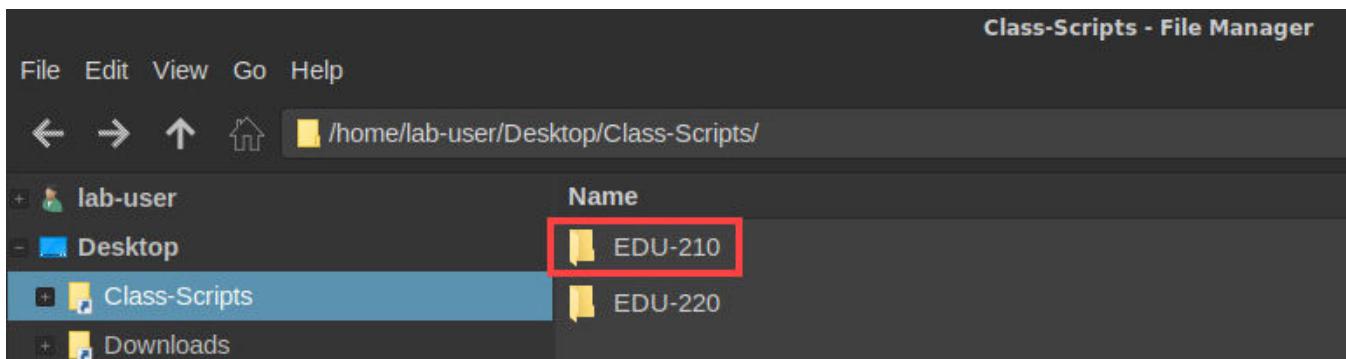
Please Note

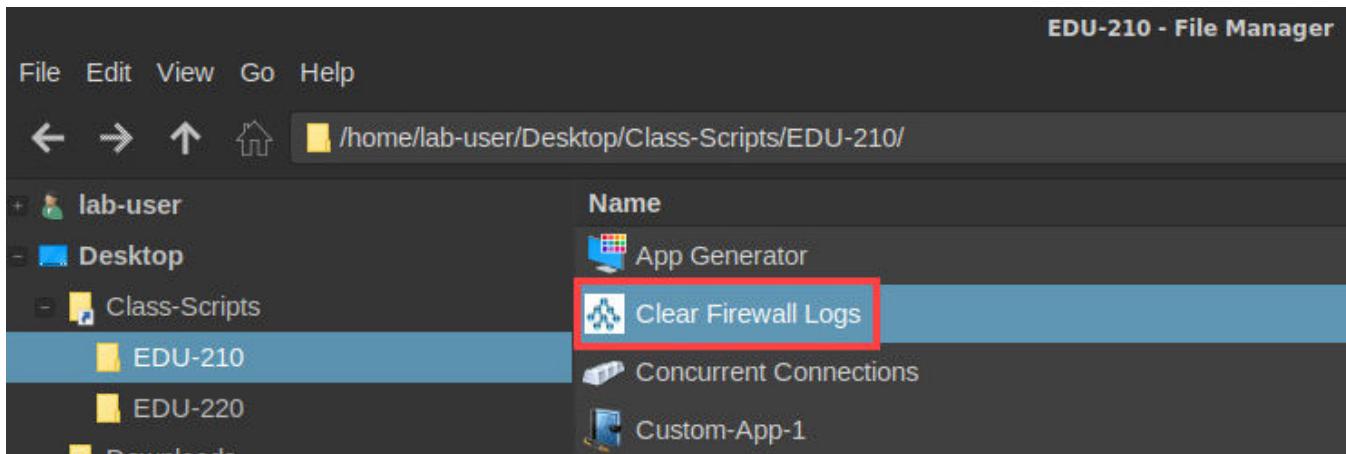
Although you can configure the security policy to control access to URLs, the URL Filtering Profile more commonly is used to configure the action that a firewall should take when it detects a URL. You will configure a URL Filtering Profile in a later lab section.

1. On the *client desktop*, double-click the folder for **Class-Scripts**.



2. Open the **EDU-210** folder.



3. Double-click the icon for **Clear Firewall Logs**.**Please Note**

This script uses the XML API to clear the Threat, Traffic and URL Filtering log files. We are clearing the log files to make it easier to identify traffic and threats blocked by DoS Protection.

4. Press **Enter** to start the *Clear Firewall Logs* script. Allow the script to complete. Once the *Clear Firewall Logs* script completes, press **Enter**.

```
Terminal
#####
##      Clear Logs from Firewall      ##
#####

This script clears the Traffic, Threat and URL Log Files from Firewall-A

Press ENTER to start or CTRL+C to quit.

Get API key for Firewall-A
% Total    % Received % Xferd  Average Speed   Time     Time     Time  Current
          Dload  Upload Total   Spent   Left Speed
100  200  100  200    0      0  498      0  --:--:--  --:--:--  --:--:--  497
Done.

Clearing Threat Logs...on Firewall-A
<response status="success"><result>Successfully deleted threat logs</result></response>  Complete.

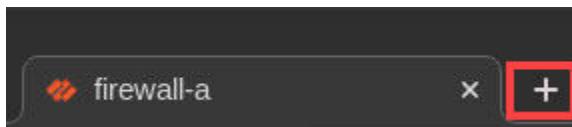
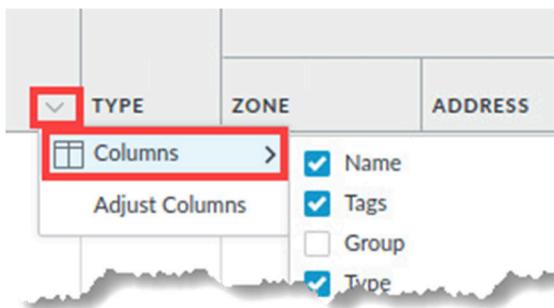
Clearing Traffic Logs...on Firewall-A
<response status="success"><result>Successfully deleted traffic logs</result></response>  Complete.

#####
##      Process Complete      ##
#####

Press ENTER to close this window.■
```

5. If you minimized the *firewall*, reopen the *firewall* interface by clicking on the **Chromium** tab in the taskbar.

6. Open a new tab in Chromium.

7. Type **hacker9.com** which belongs to the *URL category hacking* in the address bar, and press **Enter**.8. Close the *hacker9.com* tab by clicking the X icon.9. In the web interface, select **Policies > Security**. If the **URL Category** column is not displayed, click the **down-arrow** menu that appears next to any column header (hover your pointer over a header to see the **down-arrow**) and select **Columns > URL Category**.

Please Note

You may need to scroll through the Security Policies to find the URL Category once you have selected to display it.

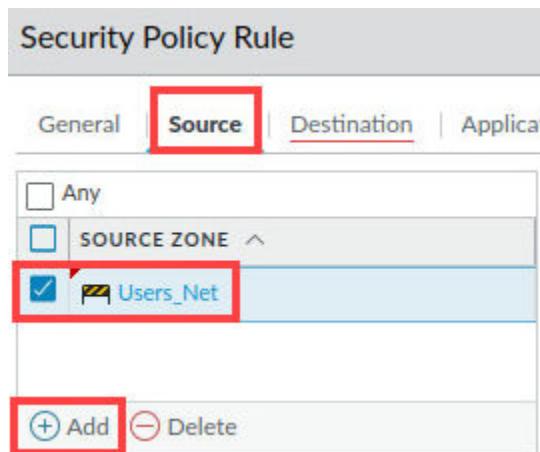
10. In the *Security Policies* window, click **Add** to create a new security policy rule.



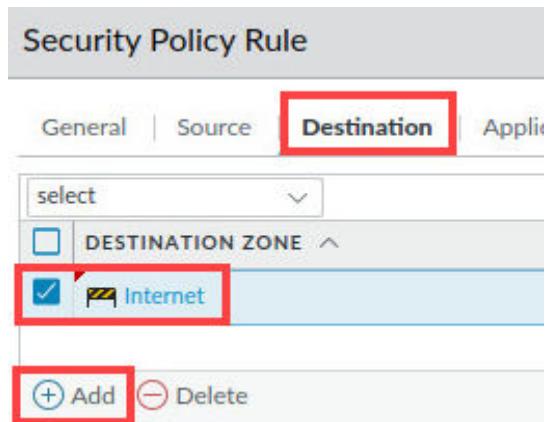
11. In the *Security Policy Rule* window, on the *General* tab, type **block-known-bad-urls** as the *Name*. For *Description*, enter **Blocks bad URL categories**.



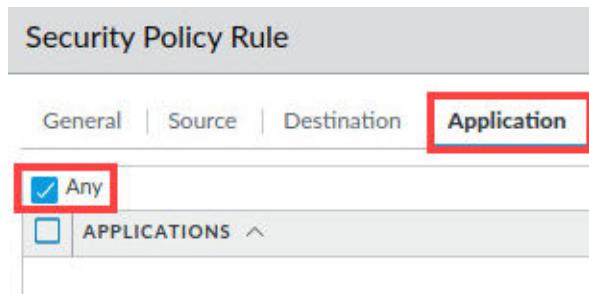
12. Click the **Source** tab and for the *Source Zone*, select **Users_Net**.



13. Click the **Destination** tab, and for the *Destination Zone*, select **Internet**.



14. Click the **Application** tab and verify that **Any** is selected.



15. Click the **Service/URL Category** tab and configure the following.

Parameter	Value
Service	application-default
URL Category	Add the following: adult command-and-control extremism hacking high-risk malware nudity parked peer-to-peer phishing proxy-avoidance-and-anonymizers questionable

Please Note

You can type in the first few letters of each category to locate each one more quickly.

Service/URL Category

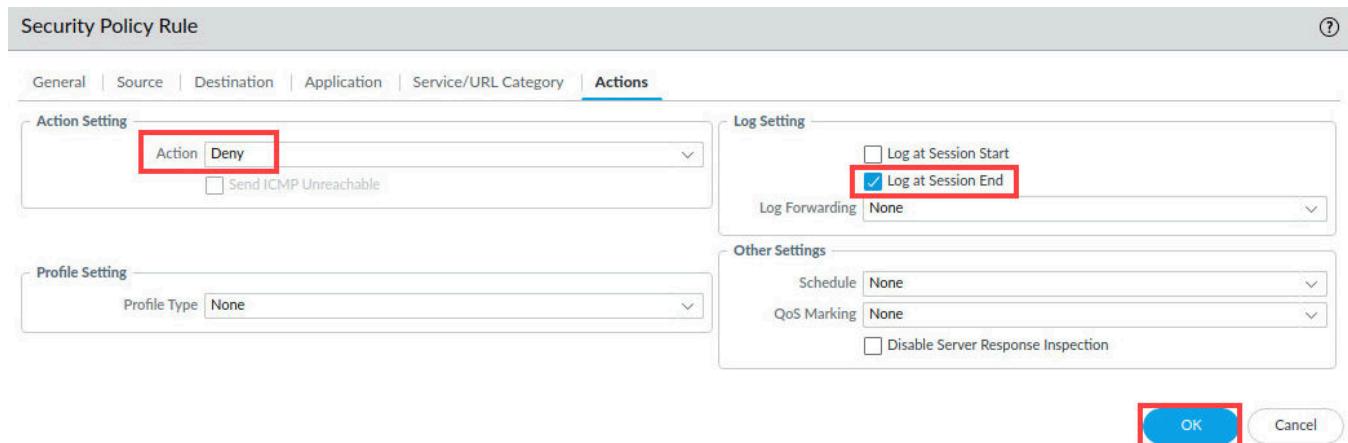
Actions

URL CATEGORY

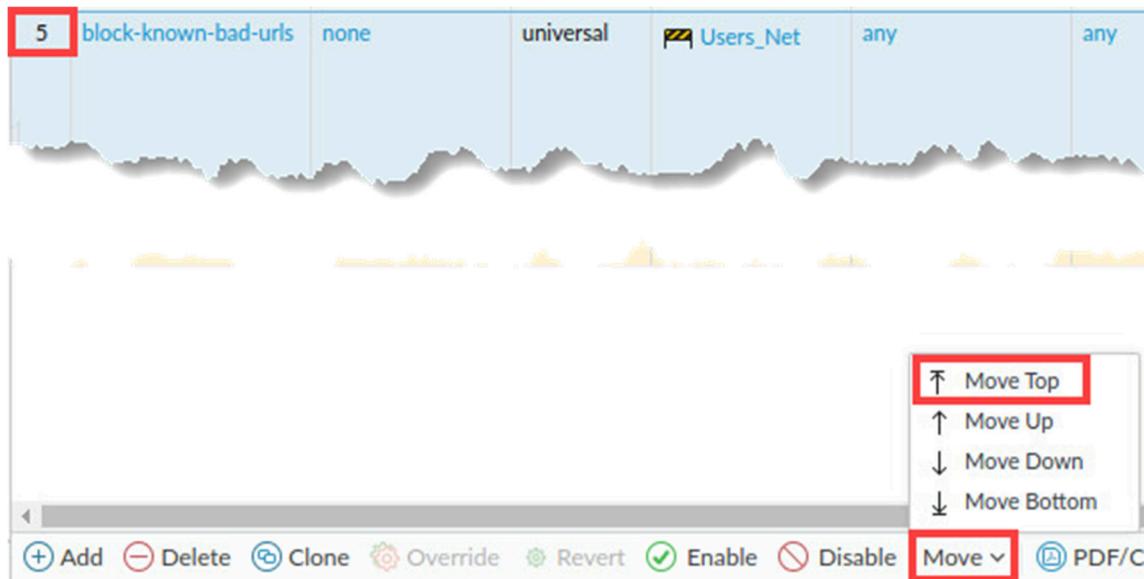
- adult
- command-and-control
- extremism
- hacking
- high-risk
- malware
- nudity

Add Delete

16. Click the **Actions** tab and for the action, select **Deny**. Verify *Log at Session End* is checked. Click **OK**.



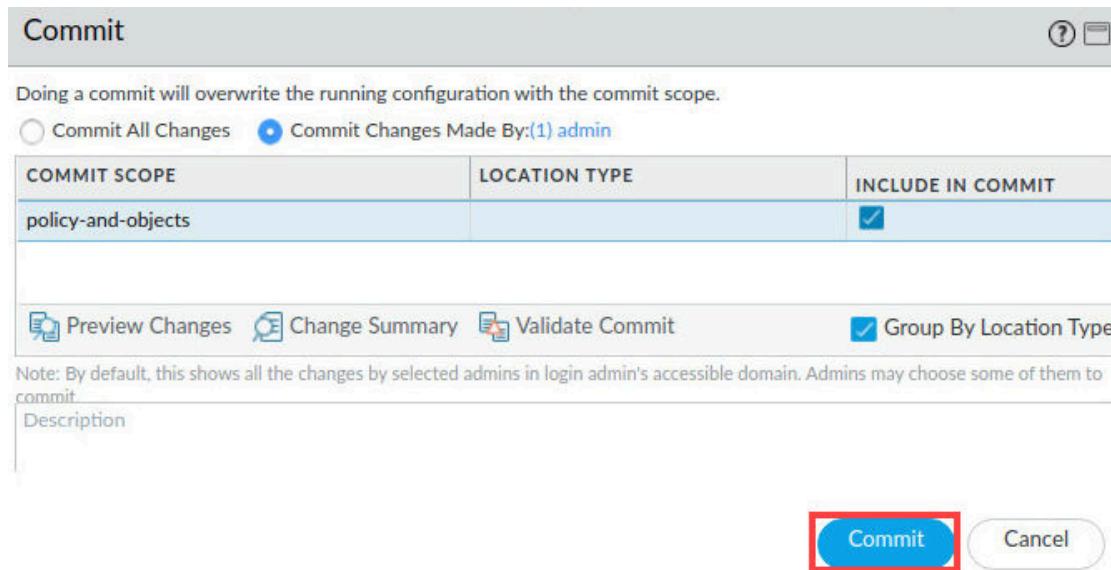
17. Select, but do not open, the **block-known-bad-urls** rule in the security policy. Select **Move > Move Top** to move the *block-known-bad-urls* rule to the top of the security policy.



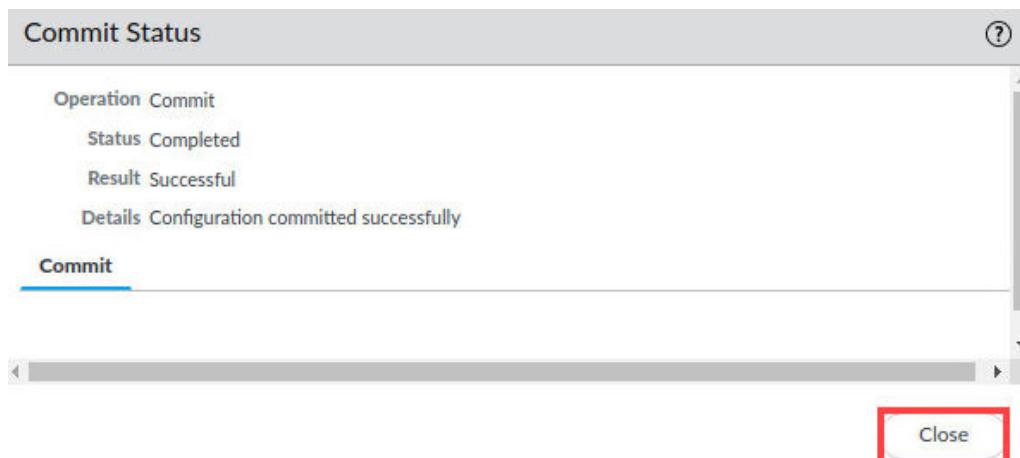
18. Click the **Commit** button at the upper-right of the web interface.



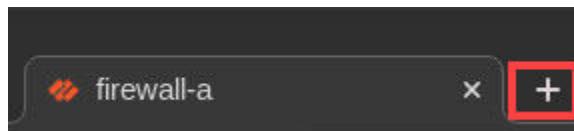
19. In the *Commit* window, click **Commit**.



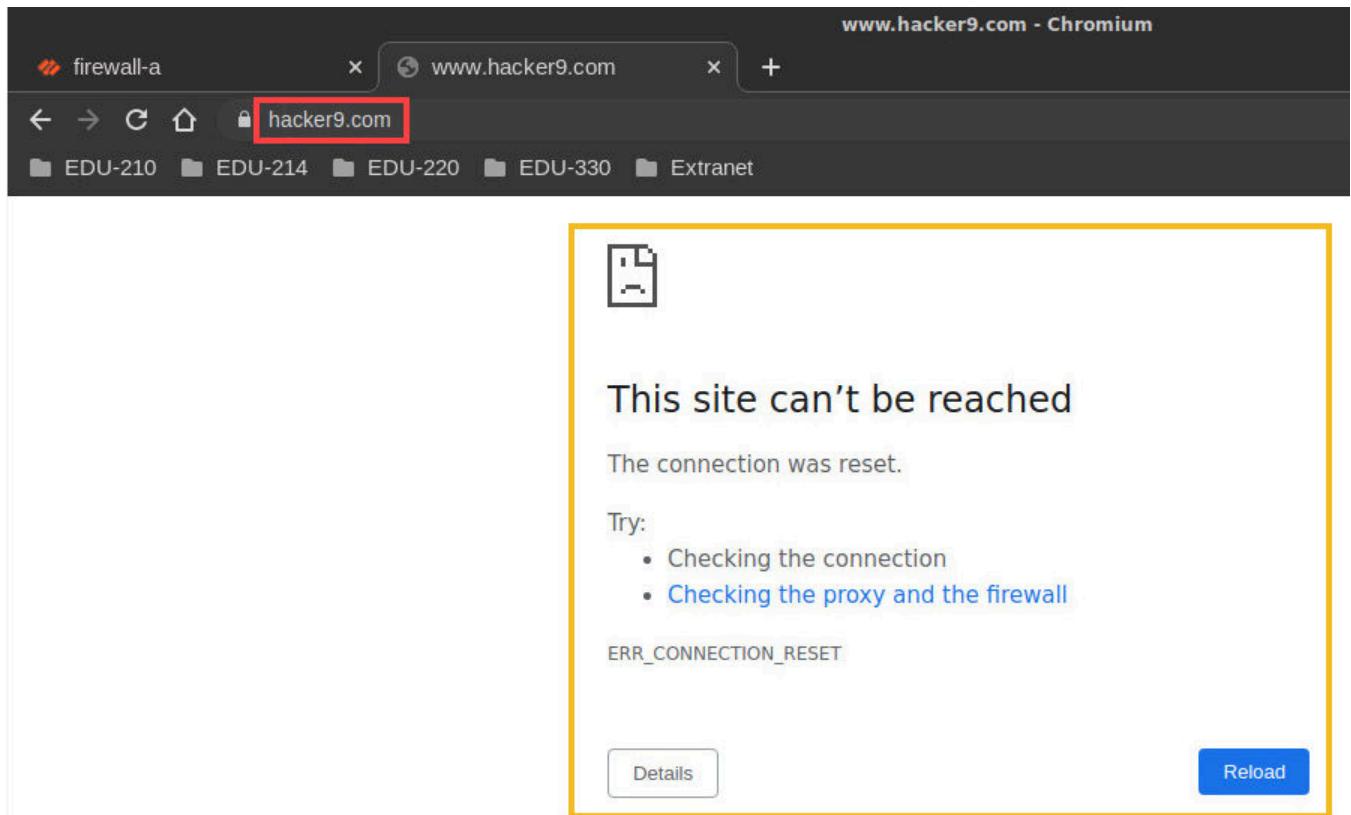
20. Wait until the *Commit* process is complete. Click **Close**.



21. Open a new tab in **Chromium**.



22. Type **hacker9.com** which belongs to the *URL category hacking* in the address bar, and press **Enter**.



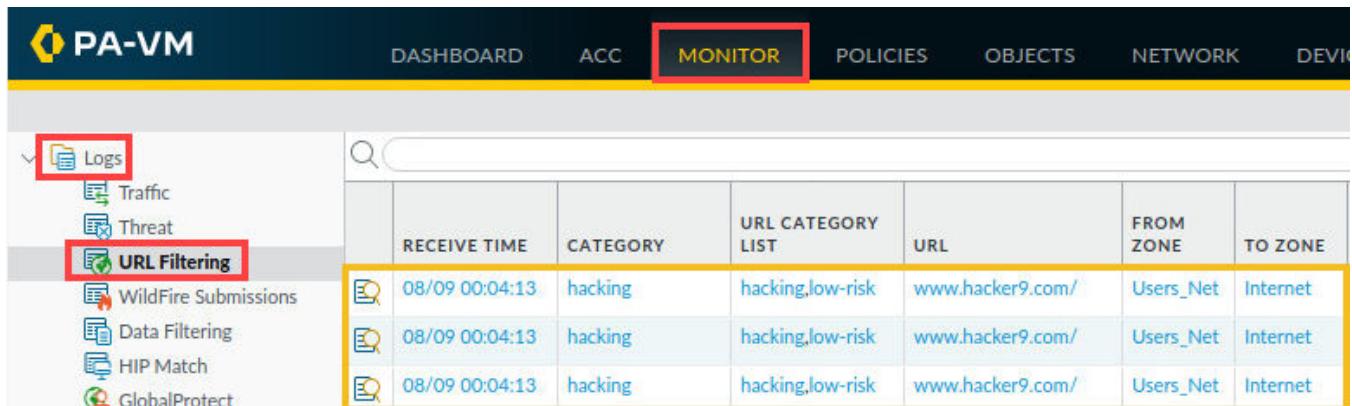
Please Note

The browser should display an error message similar to the following example because the URL category *hacking* is blocked in the security policy. If you get a browser window, it was likely a version cached locally by the browser. Refresh the browser window and access should be blocked.

23. Close the *hacker9.com* tab by clicking the X icon.



24. In the web interface, select **Monitor > Logs > URL Filtering**. If the **URL Category List** column is not displayed, click the **down-arrow** menu that appears next to any column header (hover your pointer over a header to see the **down-arrow**) and select **Columns > URL Category List**.



	RECEIVE TIME	CATEGORY	URL CATEGORY LIST	URL	FROM ZONE	TO ZONE
	08/09 00:04:13	hacking	hacking,low-risk	www.hacker9.com/	Users_Net	Internet
	08/09 00:04:13	hacking	hacking,low-risk	www.hacker9.com/	Users_Net	Internet
	08/09 00:04:13	hacking	hacking,low-risk	www.hacker9.com/	Users_Net	Internet

Please Note

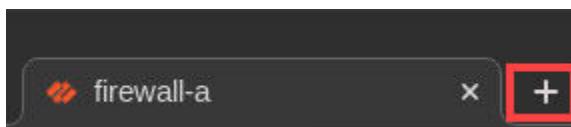
You should see multiple entries that have been blocked. Several default columns have been hidden in the example URL Filtering log file shown here.

25. Leave the firewall open and continue to the next task.

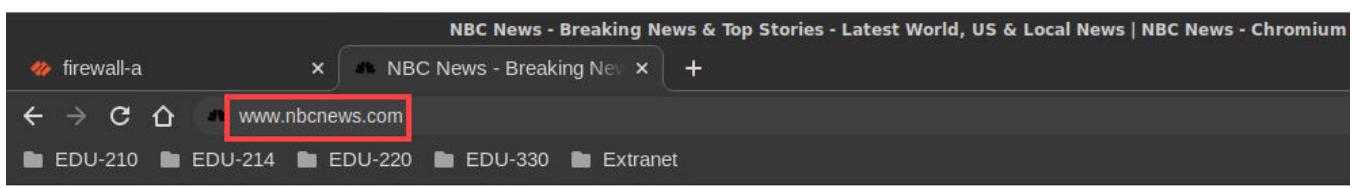
7.11 Create a Custom URL Category

In this section, you will add your Custom URL Category to a security policy rule that has a “deny” action.

1. Open a new tab in **Chromium**.



2. Type **www.nbcnews.com** and press **Enter**. The browser should display a valid webpage.

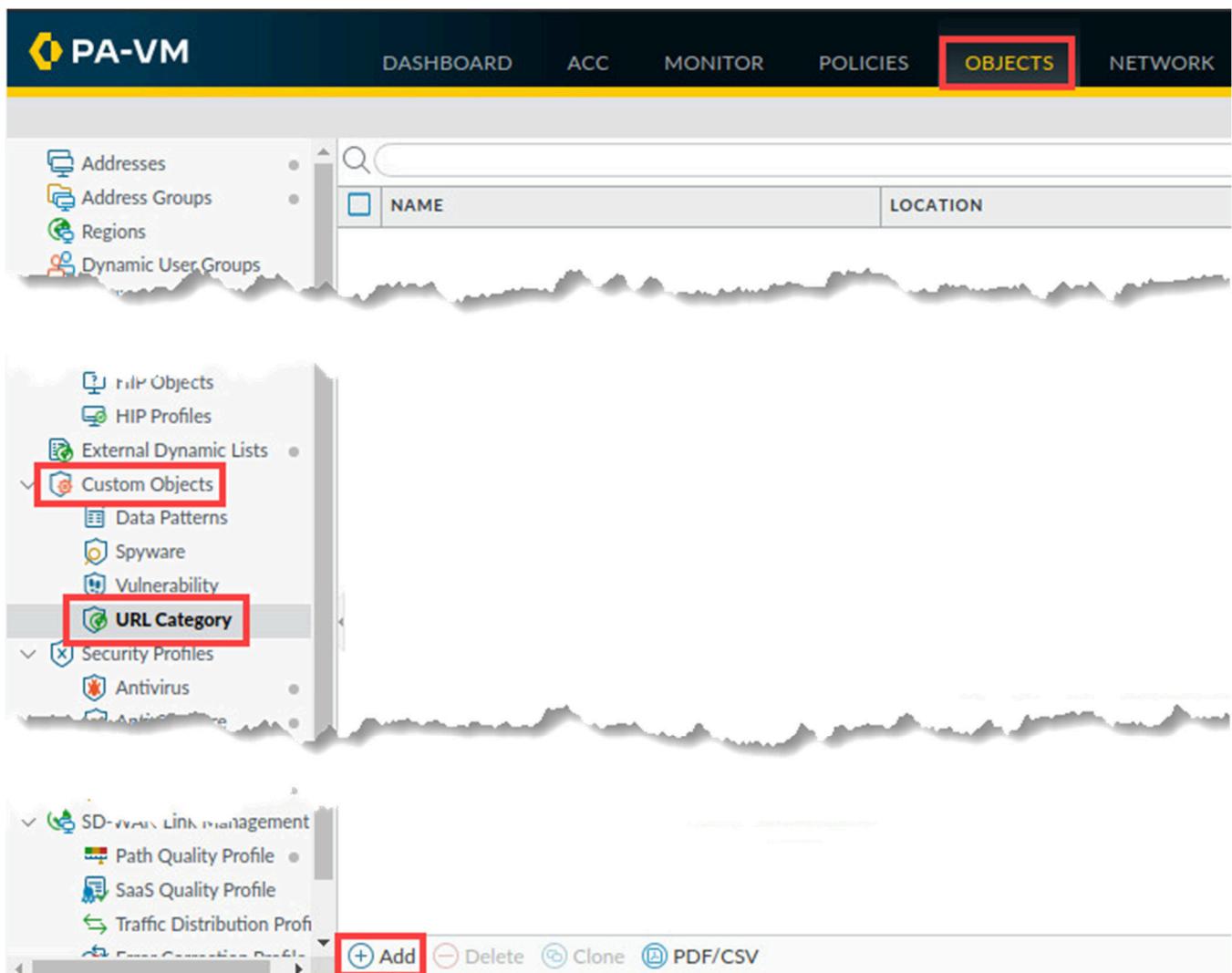



U.S. NEWS OLYMPICS POLITICS OPINION COVID-19 WORLD BUSINESS PODCASTS

3. Close the *nbcnews.com* tab by clicking the X icon.



4. In the web interface, select **Objects > Custom Objects > URL Category**. Click **Add**.



5. In the *Custom URL Category* window, configure the following. Click **OK**.

Parameter	Value
Name	block-per-company-policy
Description	URLs that are blocked by company policy.
Sites	Add the following: *.nbcnews.com *.theguardian.com

Custom URL Category

Name **block-per-company-policy**

Description **URLs that are blocked by company policy**

Type URL List

Matches any of the following URLs, domains or host names

SITES
<input type="checkbox"/> *.nbcnews.com
<input checked="" type="checkbox"/> *theguardian.com

+ Add **- Delete** | **Import** **Export**

Enter one entry per row.
Each entry may be of the form `www.example.com` or it could have wildcards like `www.*.com`.

OK **Cancel**

6. Confirm the *block-per-company-policy* Custom URL is showing in the *URL Category* window.

NAME	LOCATION
<input checked="" type="checkbox"/> block-per-company-policy	

7. Add your *Custom URL Category* to a security policy rule that has a **deny** action. Select **Policies > Security**. Click **block-known-bad-urls** to edit the rule.

NAME	TAGS	TYPE	ZONE
1 block-known-bad-urls	none	universal	Users_Net

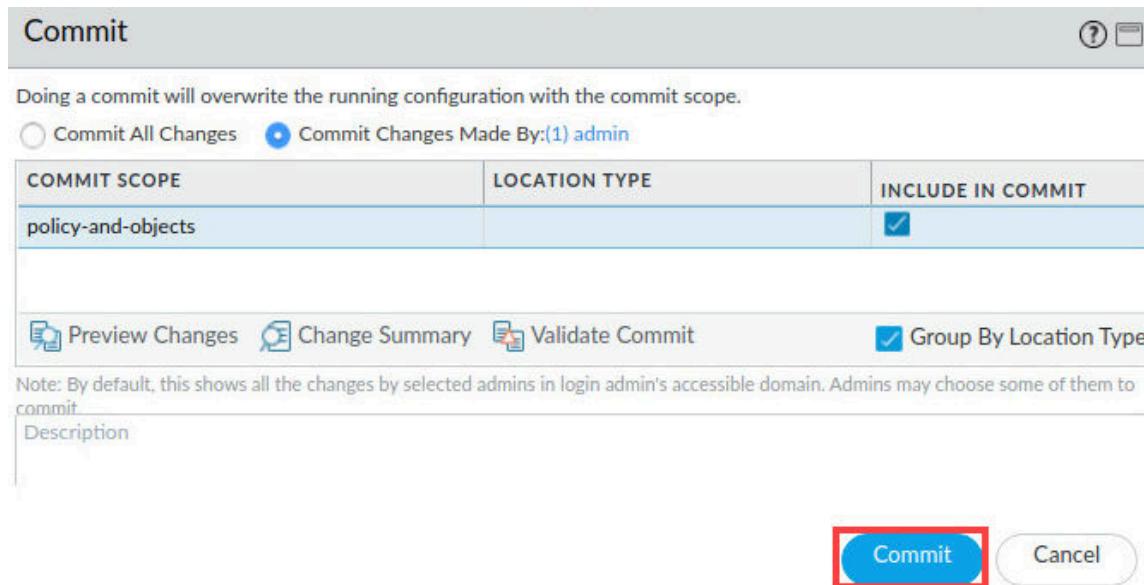
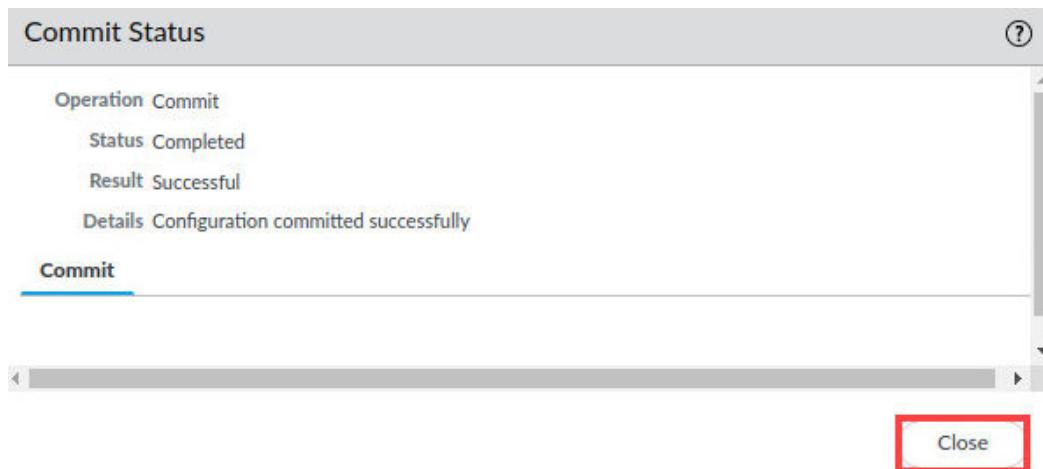
8. Select the **Service/URL Category** tab and click **Add**. Add **block-per-company-policy** to the list. Click **OK**.

application-default
<input type="checkbox"/> SERVICE

Any
 URL CATEGORY ^
 nudity
 parked
 peer-to-peer
 phishing
 proxy-avoidance-and-anonymizers
 questionable
 block-per-company-policy

9. Click the **Commit** button at the upper-right of the web interface.



10. In the *Commit* window, click **Commit**.11. Wait until the *Commit* process is complete. Click **Close**.12. Test access to URLs that belong to the *Custom URL Category* that you added to a security policy *deny* rule. Open two new tabs in **Chromium**.

13. Type `www.nbcnews.com` on the first tab and press **Enter**. Type `www.theguardian.com` on the second tab and press **Enter**.



This site can't be reached

The connection was reset.

Try:

- Checking the connection
- [Checking the proxy and the firewall](#)

`ERR_CONNECTION_RESET`

[Details](#)

[Reload](#)

Please
Note

The browser should display an error message because the Custom URL Category in the security policy blocks access to the webpage.

14. Close the *nbcnews* and *theguardian* tabs by clicking the X icon.



15. In the web interface, select **Monitor > Logs > URL Filtering**. If the **URL Category** column is not displayed, click the **down-arrow** menu that appears next to any column header (hover your pointer over a header to see the **down-arrow**) and select **Columns > URL Category**.

RECEIVE TIME	CATEGORY	URL CATEGORY LIST	URL	FROM ZONE	TO ZONE	SOURCE
08/09 00:44:35	block-per-company-policy	block-per-company-policy,news,low-risk	www.nbcnews.com/	Users_Net	Internet	192.168.1.20
08/09 00:43:35	block-per-company-policy	block-per-company-policy,news,low-risk	www.nbcnews.com/	Users_Net	Internet	192.168.1.20
08/09 00:43:05	block-per-company-policy	block-per-company-policy,news,low-risk	www.nbcnews.com/	Users_Net	Internet	192.168.1.20
08/09 00:43:00	block-per-company-policy	block-per-company-policy,news,low-risk	www.theguardian.com/	Users_Net	Internet	192.168.1.20
08/09 00:42:59	block-per-company-policy	block-per-company-policy	www.theguardian.com/	Users_Net	Internet	192.168.1.20

Please Note

You should see multiple entries for sessions to www.nbcnews.com and www.theguardian.com that the firewall has blocked.

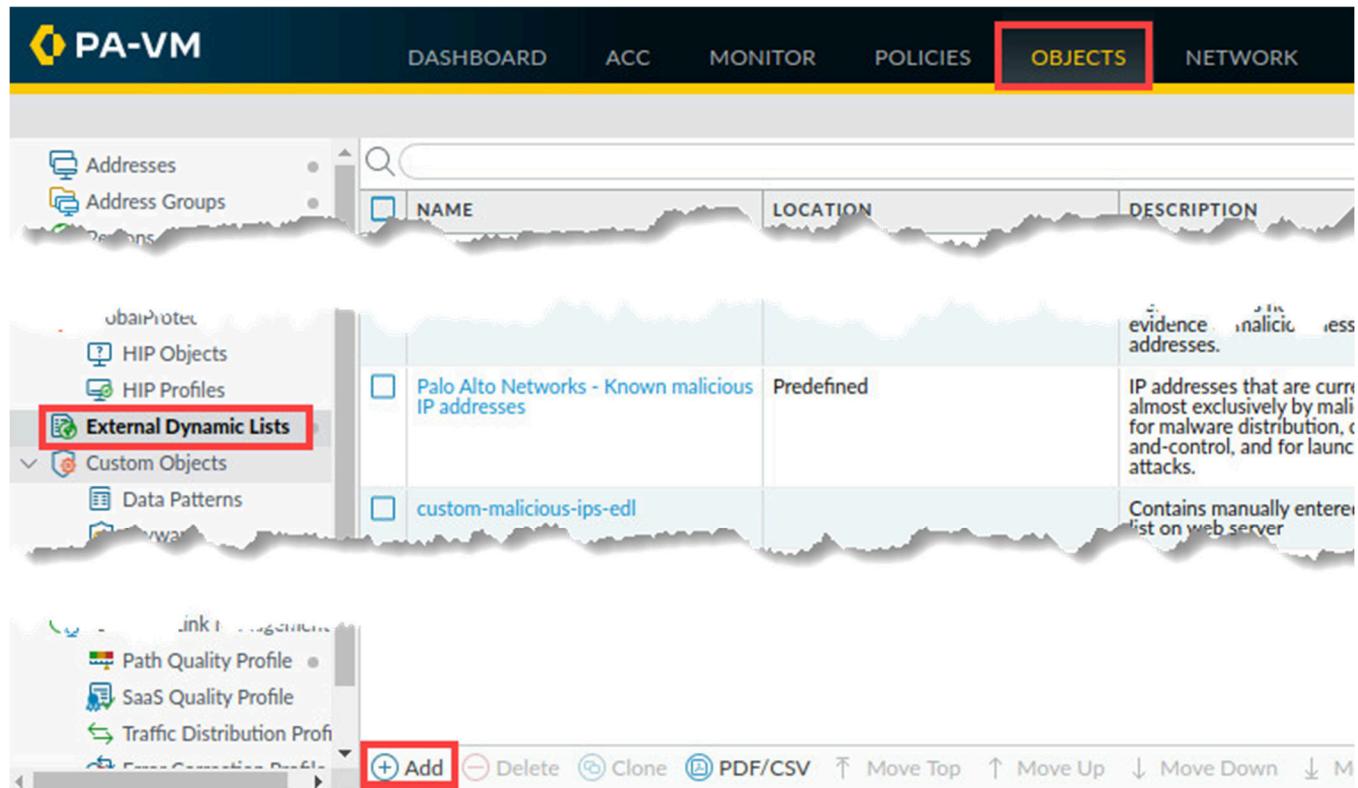
16. Leave the firewall open and continue to the next task.

7.12 Create an EDL to Block Malicious URL Access

You can add a list of malicious URLs to a file on an external web server and then configure the firewall to access the list as an EDL. The advantage of this approach is that you can regularly update the malicious URL list without the need to recommit the firewall configuration each time, as you would have to do if you updated a security policy rule with a new URL.

In this section, you will create an EDL to block malicious URL access.

1. In the web interface, select **Objects > External Dynamic Lists**. Click **Add**.



The screenshot shows the PA-VM web interface with the 'OBJECTS' tab selected. In the left sidebar, the 'External Dynamic Lists' option is highlighted with a red box. The main table displays two entries: 'Palo Alto Networks - Known malicious IP addresses' (Predefined) and 'custom-malicious-ips-edl' (Custom). At the bottom of the table, there is an 'Add' button highlighted with a red box.

NAME	LOCATION	DESCRIPTION
Palo Alto Networks - Known malicious IP addresses	Predefined	IP addresses that are currently almost exclusively used for malware distribution, command-and-control, and for launching attacks.
custom-malicious-ips-edl		Contains manually entered list on web server.

2. In the *External Dynamic Lists* window, configure the following. Click **OK**.

Parameter	Value
Name	malicious-urls-edl
Type	URL List
Source	http://192.168.50.80/malicious-urls.txt (The EDL contains only the URL www.popurls.com)
Check for updates	Five Minute

External Dynamic Lists

Name **malicious-urls-edl**

Type **URL List**

Description

Source **http://192.168.50.80/malicious-urls.txt**

Server Authentication

Certificate Profile **None**

Check for updates **Five Minute**

Test Source URL **OK** Cancel

Please Note The malicious-urls.txt file contains an entry for popurls.com.

3. In the *External Dynamic Lists* window, click **malicious-urls-edl**.

<input type="checkbox"/>	Palo Alto Networks - Authentication Portal Exclude List
<input type="checkbox"/>	malicious-urls-edl

4. Click **Test Source URL** and verify the firewall can access the *EDL URL*.

External Dynamic Lists

Name

[Create List](#) | [List Entries And Exceptions](#)

Type

Description

Source

Server Authentication

Certificate Profile

Check for updates

[Test Source URL](#) Test Source URL OK Cancel

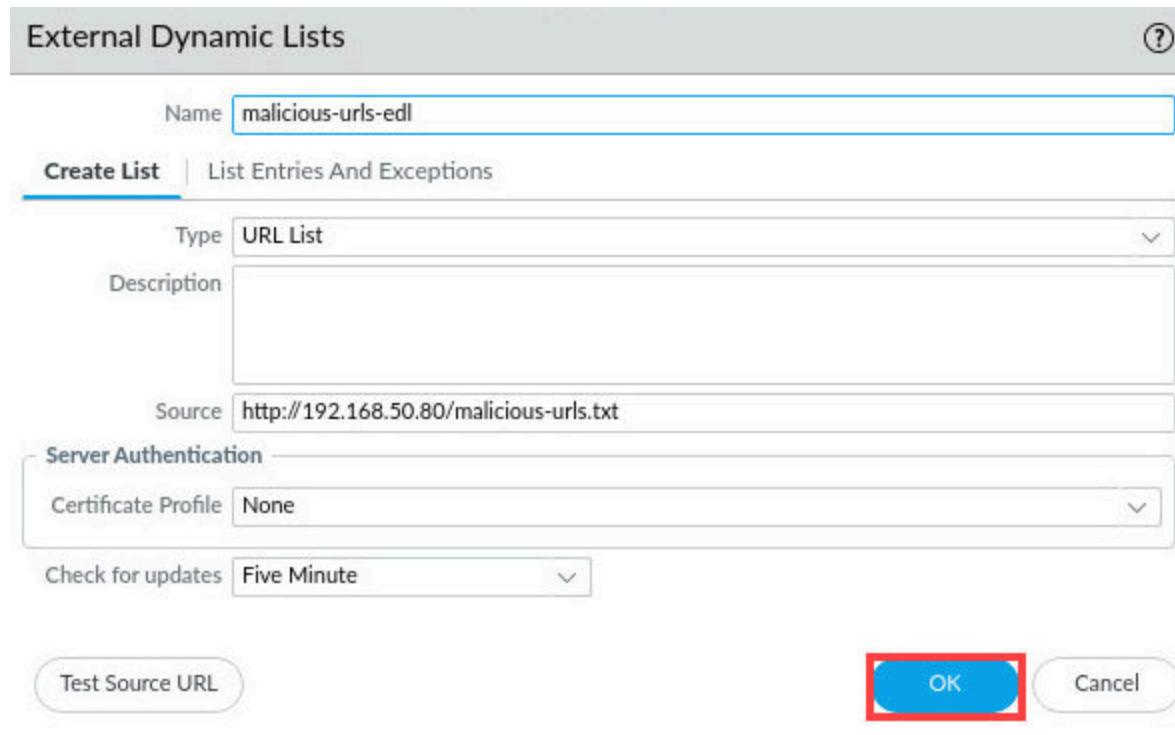
5. In the *Test Source URL* window, verify the *Source URL* is accessible. Click **Close**.

Test Source URL

Source URL is accessible.

Close

6. In the *External Dynamic List* window, click **OK**.



External Dynamic Lists

Name: malicious-urls-edl

Create List | List Entries And Exceptions

Type: URL List

Description:

Source: http://192.168.50.80/malicious-urls.txt

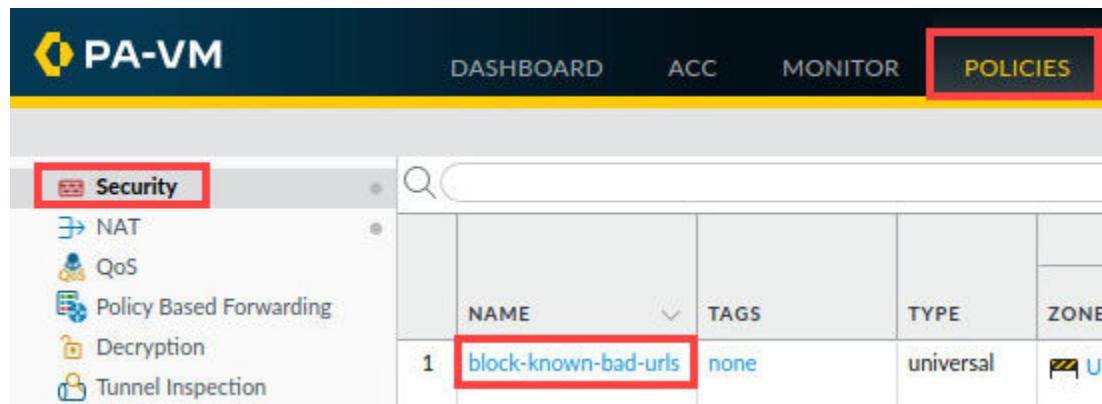
Server Authentication

Certificate Profile: None

Check for updates: Five Minute

Test Source URL | OK | Cancel

7. Add the *EDL* containing the malicious URL list to a security policy rule with a *deny* action. In the web interface, select **Policies > Security**. Click **block-known-bad-urls** to edit the rule.



PA-VM

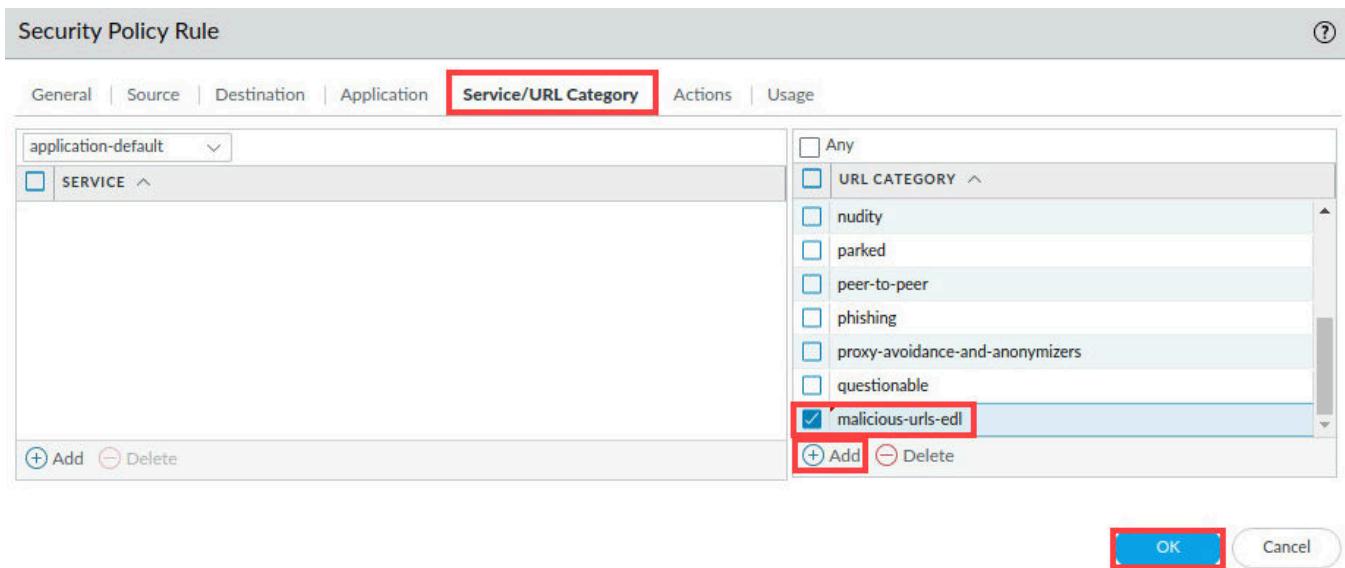
DASHBOARD ACC MONITOR POLICIES

Security

NAT QoS Policy Based Forwarding Decryption Tunnel Inspection

NAME	TAGS	TYPE	ZONE
block-known-bad-urls	none	universal	U

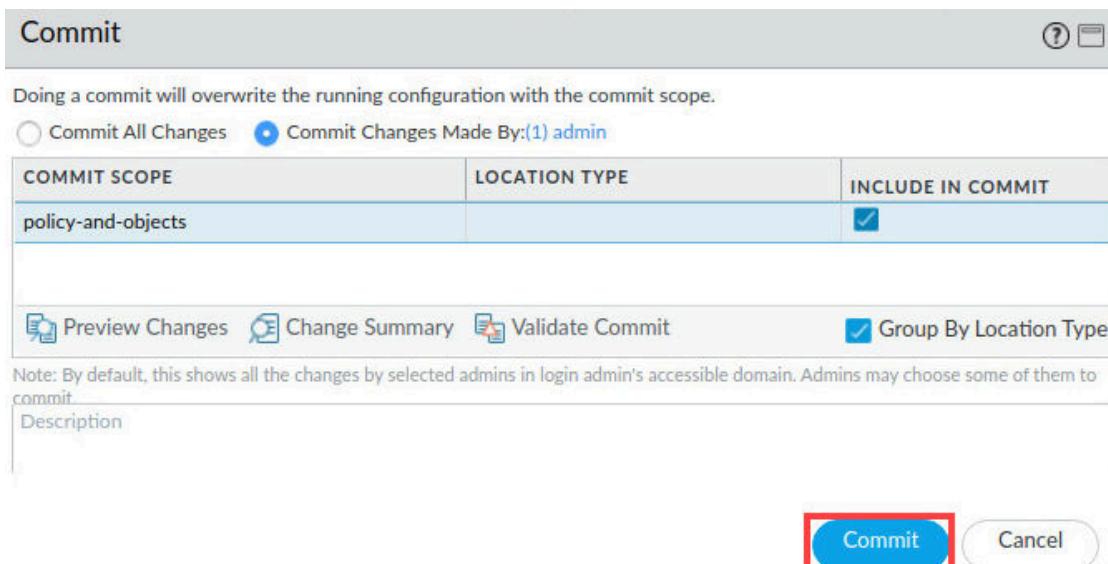
8. In the **Security Policy Rule** window, click the **Service/URL Category** tab. Add **malicious-urls-edl** to the list. Click **OK**.



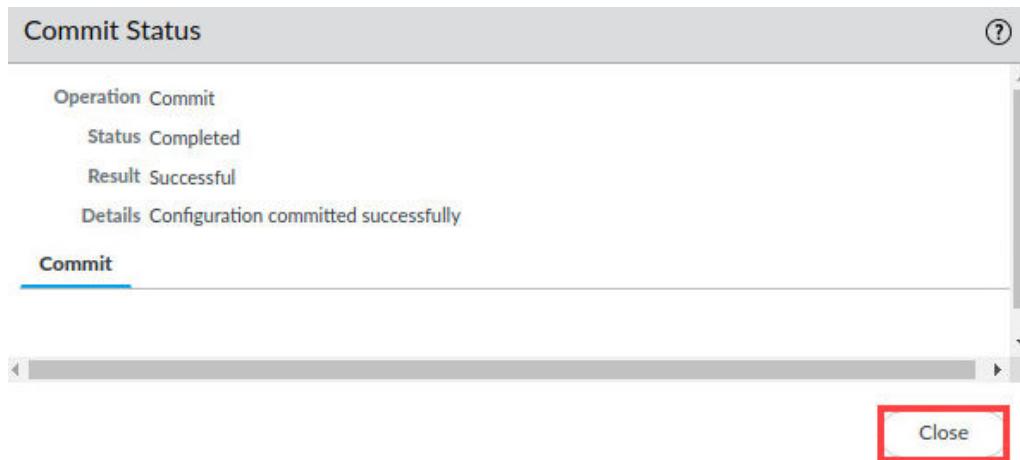
9. Click the **Commit** button at the upper-right of the web interface.



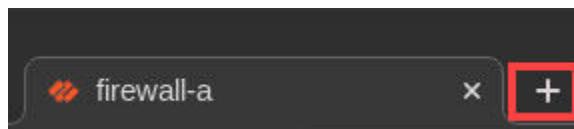
10. In the **Commit** window, click **Commit**.



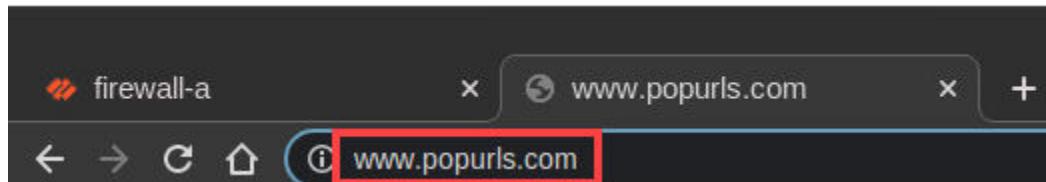
11. Wait until the *Commit* process is complete. Click **Close**.



12. Test access to a URL contained in the EDL that you added to the *block-known-bad-urls* security policy. Open a new tab in **Chromium**.



13. Type **http://www.popurls.com** in the address bar.



14. The browser displays a block page because the EDL in the security policy blocks access to the *popurls.com* webpage.



This site can't be reached

The connection was reset.

Try:

- Checking the connection
- [Checking the proxy and the firewall](#)

ERR_CONNECTION_RESET

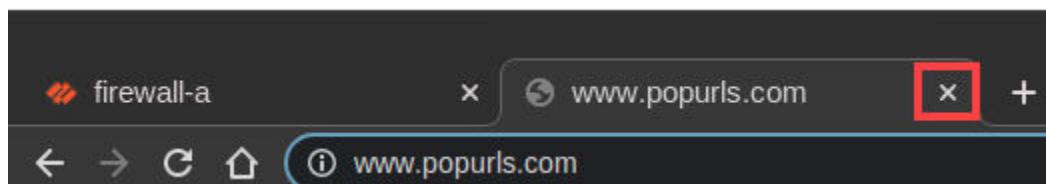
Details

Reload

Please
Note

The browser should display an error message because the Custom URL Category in the security policy blocks access to the webpage.

15. Close the *popurls.com* tab by clicking the X icon.



16. In the web interface, select **Monitor > Logs > URL Filtering**. Type (**action eq block-url**) in the filter builder. You should see multiple entries for sessions to **www.popurls.com** that the firewall has blocked.

	RECEIVE TIME	CATEGORY	URL CATEGORY LIST	URL	FROM ZONE	TO ZONE
	08/09 01:16:30	malicious-urls-edl	malicious-urls-edl,news,low-risk	www.popurls.com/	Users_Net	Internet
	08/09 01:15:30	malicious-urls-edl	malicious-urls-edl,news,low-risk	www.popurls.com/	Users_Net	Internet
	08/09 01:15:00	malicious-urls-edl	malicious-urls-edl,news,low-risk	www.popurls.com/	Users_Net	Internet
	08/09 01:14:55	malicious-urls-edl	malicious-urls-edl,news,low-risk	www.popurls.com/	Users_Net	Internet

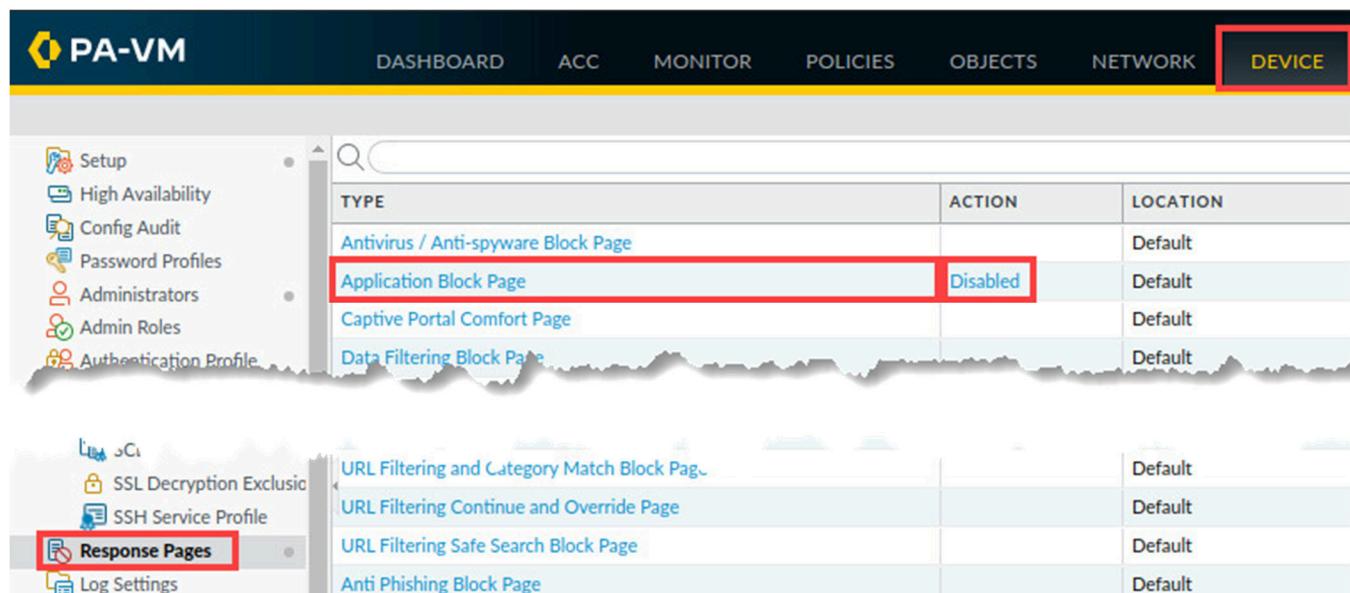
17. Leave the firewall open and continue to the next task.

7.13 Block Access to a Malicious URL Using a URL Filtering Profile

Now you will configure a URL Filtering Profile to control access to URLs. You must add the URL Filtering Profile to a security policy rule with an “allow” action. The use of a URL Filtering Profile to block access to URLs typically is easier to maintain over time compared to the addition of URLs to a security policy block rule. You will also enable the Application Block Page, which instructs the firewall to present a warning page to users when they access websites that have been purposely blocked.

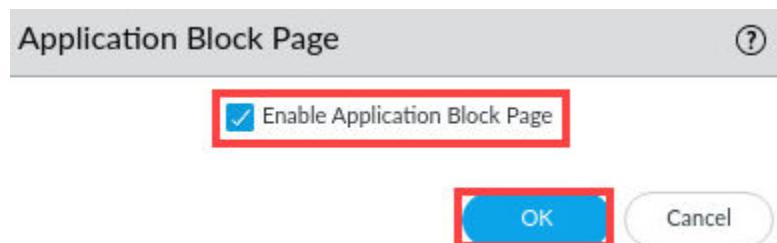
In this section, you will block access to a Malicious URL with a URL Filtering Profile and test the URL Filtering Profile.

1. In the web interface, select **Device > Response Pages**. Locate the entry for **Application Block Page** and click the link for **Disabled** under the **Action** column.



TYPE	ACTION	LOCATION
Antivirus / Anti-spyware Block Page		Default
Application Block Page	Disabled	Default
Captive Portal Comfort Page		Default
Data Filtering Block Page		Default
URL Filtering and Category Match Block Page		Default
URL Filtering Continue and Override Page		Default
URL Filtering Safe Search Block Page		Default
Anti Phishing Block Page		Default

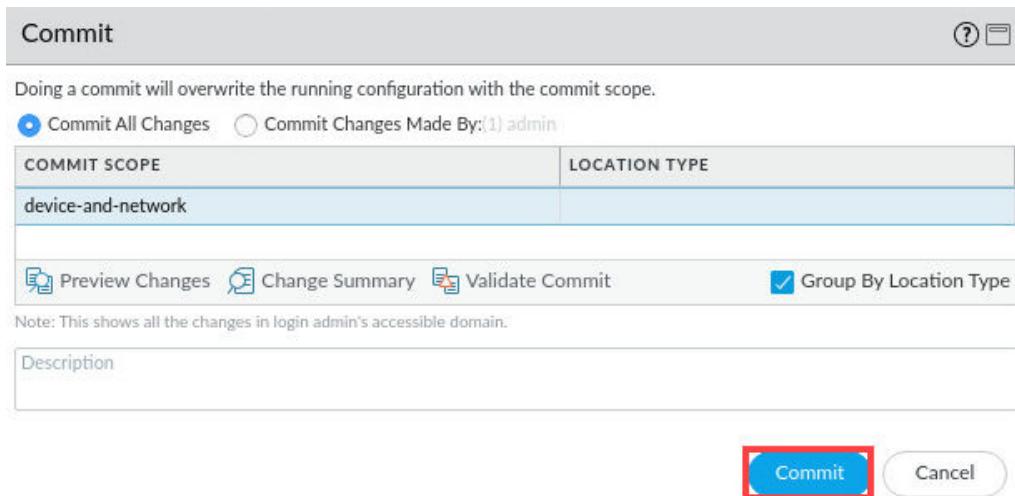
2. In the **Application Block Page** window, place a **check** in the box for **Enable Application Block Page**. Click **OK**.



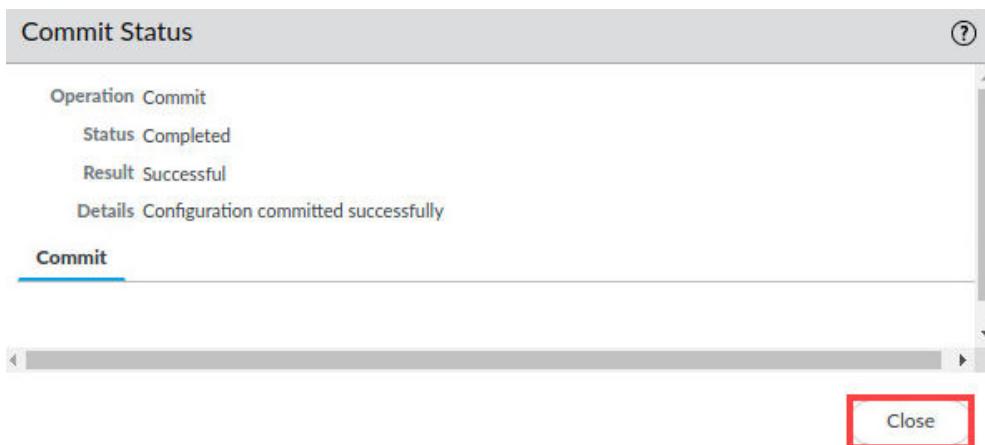
3. Click the **Commit** button at the upper-right of the web interface.



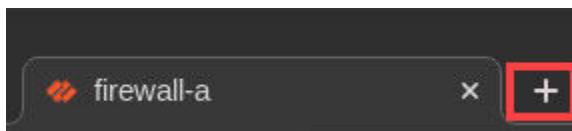
4. In the *Commit* window, click **Commit**.



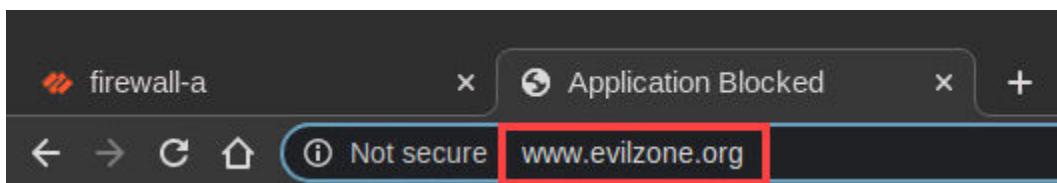
5. Wait until the *Commit* process is complete. Click **Close**.



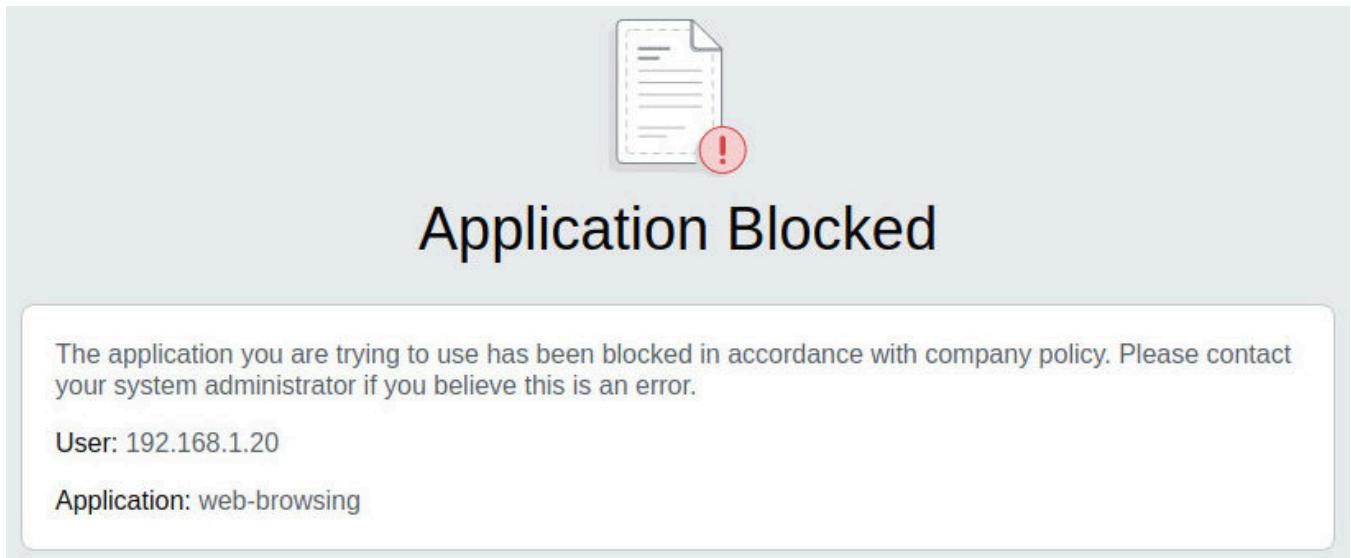
6. Test the *Application Block Page* response. Open a new tab in **Chromium**.



7. Type **www.evilzone.org** in the address bar, press **Enter**.



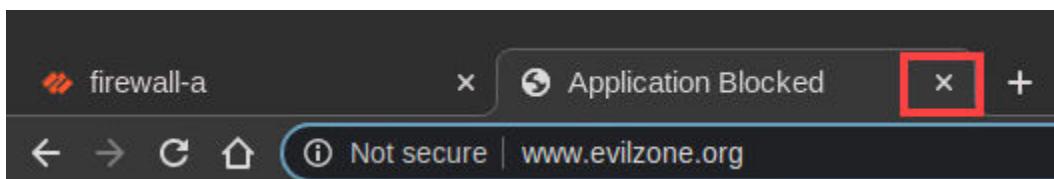
8. The browser displays a block page because the EDL in the security policy blocks access to the evilzone.org webpage.



Please Note

The browser should display a block page because the URL belongs to the URL category *hacking*, which is blocked by a security policy rule. You will continue to block access to this website but will use another method.

9. Close the evilzone.org tab by clicking the X icon.



10. In the web interface, select **Objects > Security Profiles > URL Filtering**. Click **Add** to create a new profile.

The screenshot shows the PA-VM web interface. The top navigation bar has tabs: DASHBOARD, ACC, MONITOR, POLICIES, **OBJECTS** (which is highlighted with a red box), and NETWORK. The left sidebar has a tree view with nodes: Addresses, Address Groups, Regions, Dynamic User Groups, Applications, Vulnerability, URL Category, **Security Profiles** (which is highlighted with a red box), Antivirus, Anti-Spyware, Vulnerability Protection, **URL Filtering** (which is highlighted with a red box), File Blocking, WildFire Analysis, and SaaS Quality Profile, Traffic Distribution Profile. At the bottom of the page, there is a toolbar with buttons: **Add** (which is highlighted with a red box), Delete, Clone, PDF/CSV, and a note: (* indicates custom URL category, + indicates).

11. In the *URL Filtering Profile*, type **Corp-URL-Profile** as the *Name* of the profile. For *Description*, enter **Company URL Filtering profile**.

The screenshot shows the 'URL Filtering Profile' configuration page. The 'Name' field is set to **Corp-URL-Profile** and the 'Description' field is set to **Company URL Filtering profile**. The 'Categories' tab is selected. Other tabs include URL Filtering Settings and User Credential Detection.

12. On the **Categories** tab, configure the following. You will need to scroll through each *Category* for the value to set it to block the site access.

Parameter	Value
Site Access	Configure the block action for the following URL categories: block-per-company-policy* (your Custom URL Category) malicious-urls-edl+ (your custom URL list) adult command-and-control extremism hacking high-risk malware nudity parked peer-to-peer phishing proxy-avoidance-and-anonymizers questionable

75 items	
SITE ACCESS	USER CREDENTIAL SUBMISSION
block	block
block	block
allow	allow
allow	allow

Please Note

These categories are the same ones you set to **block** earlier using the URL Category as part of the security policy rule. In this configuration, the firewall will use the URL Filtering profile to block these categories.

13. Select the tab for **Inline ML**. For **Phishing Detection** and **Javascript Exploit Detection**, set the **Policy Action** to **block**. Click **OK**.

URL Filtering Profile

Name: Corp-URL-Profile

Description: Company URL Filtering profile

Categories | URL Filtering Settings | User Credential Detection | HTTP Header Insertion | **Inline ML**

Available Models

MODEL	DESCRIPTION	ACTION
Phishing Detection	Machine Learning engine to dynamically identify credential phishing pages	block
Javascript Exploit Detection	Machine Learning engine to dynamically detect Javascript based exploitation attacks	block

OK Cancel

14. In the web interface, select **Policies > Security**. Click **Users_to_Internet** to edit the rule.

PA-VM

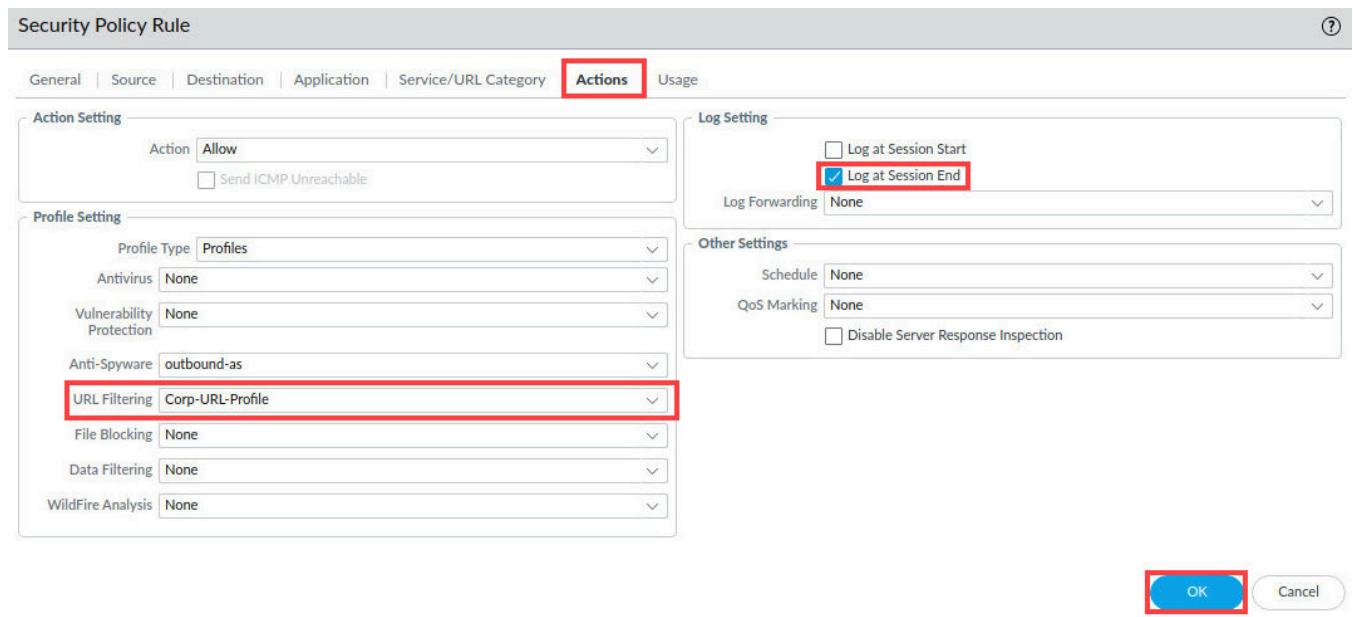
DASHBOARD ACC MONITOR **POLICIES** OBJECTS

Security NAT QoS

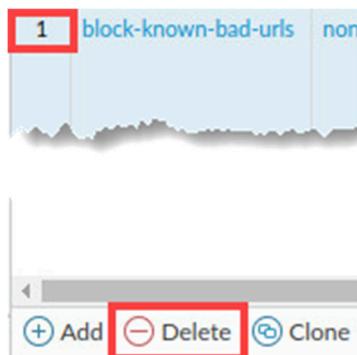
Order	Name	Action	Scope	Profile	Target
3	Users_to_Extranet	none	universal	Users_Net	any
4	Users_to_Internet	none	universal	Users_Net	any
5	Extranet_to_Internet	none	universal	Extranet	any

15. In the *Security Policy Rule* window, click the **Actions** tab and configure the following. Click **OK**.

Parameter	Value
Action	Allow
Log Setting	Log at Session End
Profile Type	Profiles
URL Filtering	Corp-URL-Profile



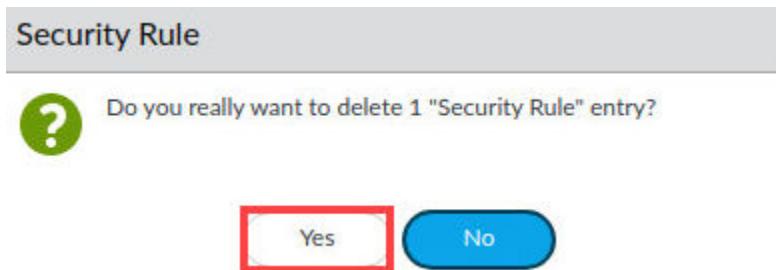
16. Select, but do not open the *block-known-bad-urls* security policy rule. Click **Delete** to remove the *block-known-bad-urls* rule.



Please
Note

This rule no longer will be used to block access to the URLs. Instead, the "Users_to_Internet" rule with its attached URL Filtering Profile will control URL access.

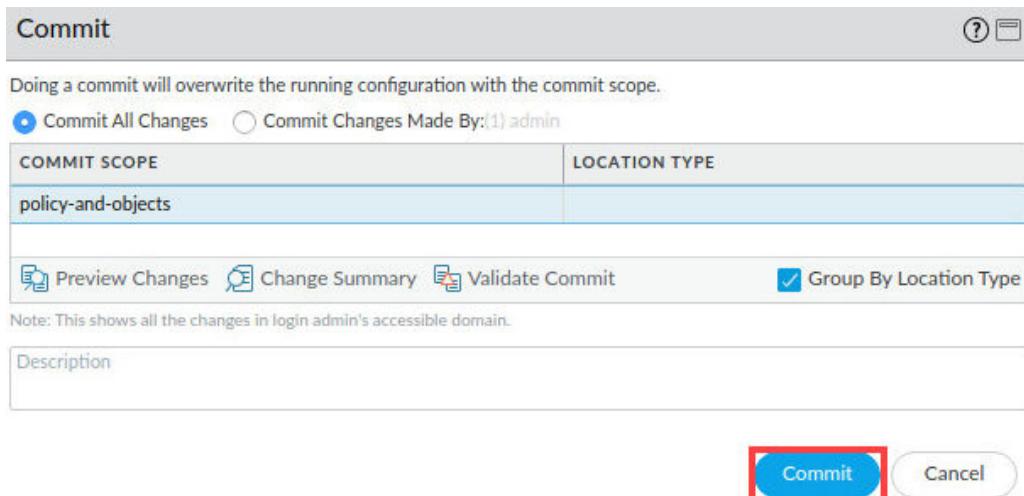
17. In the *Security Rule* window, click **Yes** to confirm the deletion.



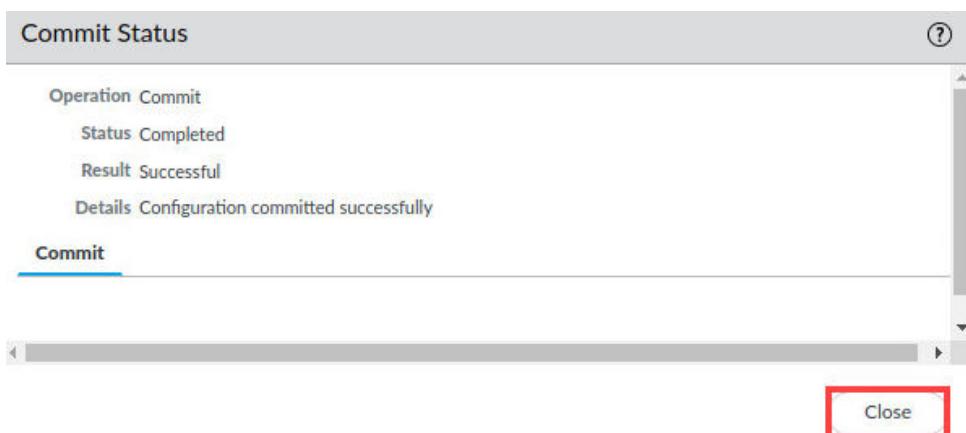
18. Click the **Commit** button at the upper-right of the web interface.



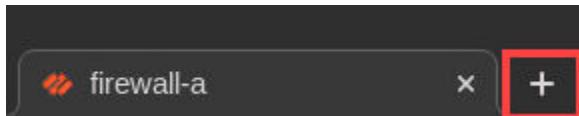
19. In the *Commit* window, click **Commit**.



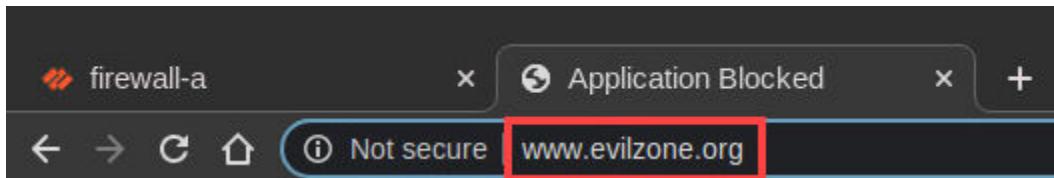
20. Wait until the *Commit* process is complete. Click **Close**.



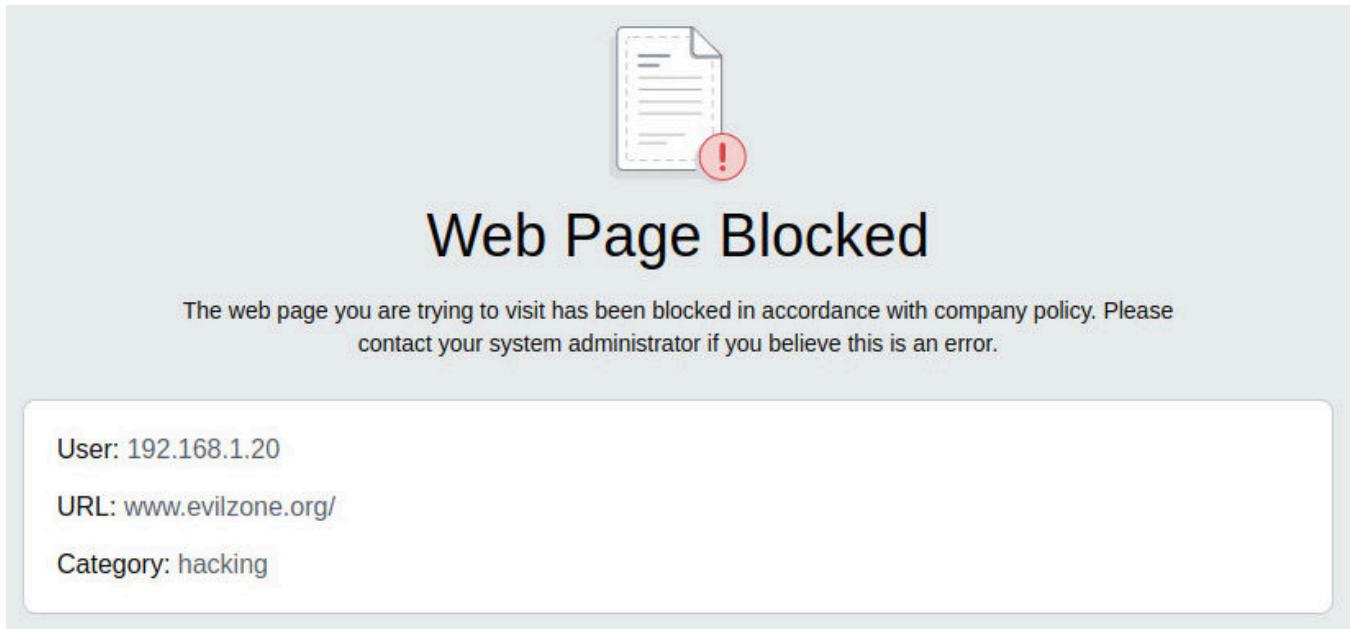
21. Test the *Application Block Page* response. Open a new tab in **Chromium**.



22. Type **www.evilzone.org** and press **Enter**.



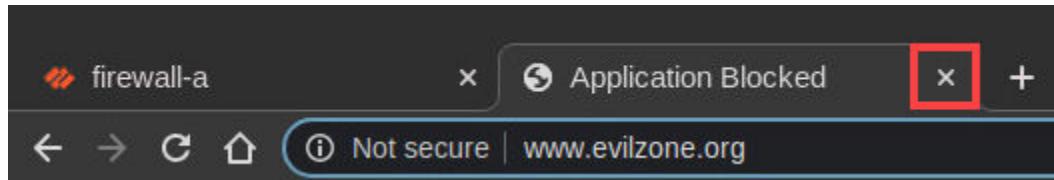
23. The browser displays a block page because the EDL in the security policy blocks access to the *evilzone.org* webpage. If the *Web Page Blocked* message does not appear, allow 1 to 3 minutes for the firewall to process the changes, then refresh the *evilzone.org* tab.



Please Note

The browser should display a block page because the URL belongs to the URL category *hacking*, which is blocked by a security policy rule. You will continue to block access to this website but will use another method.

24. Close the *evilzone.com* tab by clicking the X icon.



25. Examine the URL Filtering Log under **Monitor > Logs > URL Filtering**.

RECEIVE TIME	CATEGORY	URL CATEGORY LIST	URL	FROM ZONE	TO ZONE	SOURCE
08/09 02:38:36	hacking	hacking,low-risk	www.evilzone.org/fav...	Users_Net	Internet	192.168.1.20
08/09 02:38:36	hacking	hacking,low-risk	www.evilzone.org/log...	Users_Net	Internet	192.168.1.20
08/09 02:38:36	hacking	hacking,low-risk	www.evilzone.org/ ...	Users_Net	Internet	192.168.1.20
08/09 02:07:33	hacking	hacking,low-risk	www.evilzone.org/fav...	Users_Net	Internet	192.168.1.20

26. The lab is now complete; you may end your reservation.