Configure Firewall Threat Defense Modular Policy Framework

Contents

Introduction

This document describes the Firewall Threat Defense (FTD) Modular Policy Framework (MPF)

Prerequisites

Requirements

There are not specific requirements for this document.

Components Used

The information in this document is based on these software and hardware versions:

- Cisco Secure Firewall 3130 Threat Defense Version 10.0.0 (Build 140)
- Firewall Management Center (FMC) Version 10.0.0 (Build 140)

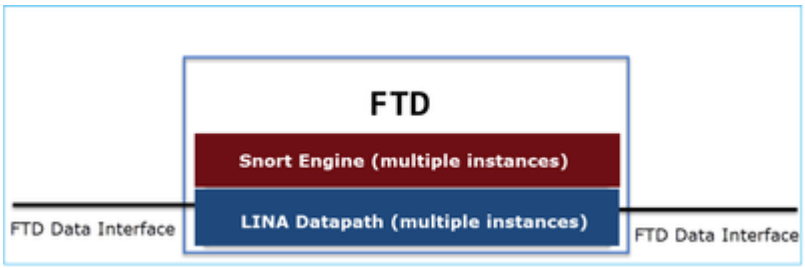
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

FTD Data Plane Overview

FTD is a unified software image that consists of 2 main engines:

- Datapath (also known as LINA)
- Snort engine



The LINA Datapath and the Snort Engine are the main parts of the FTD's Data Plane.

MPF Ingredients

MPF uses these components:

- **class-map** matches the interesting traffic.
- **policy-map** applies actions to the interesting traffic matched by the class-map.
- **service-policy** applies the policy-map globally (on all interfaces) or on a specific interface.

Feature Directionality

Regarding feature directionality, consult the ASA configuration guide:

https://www.cisco.com/c/en/us/td/docs/security/asa/asa924/configuration/firewall/asa-924-firewall-config/inspect-service-policy.html

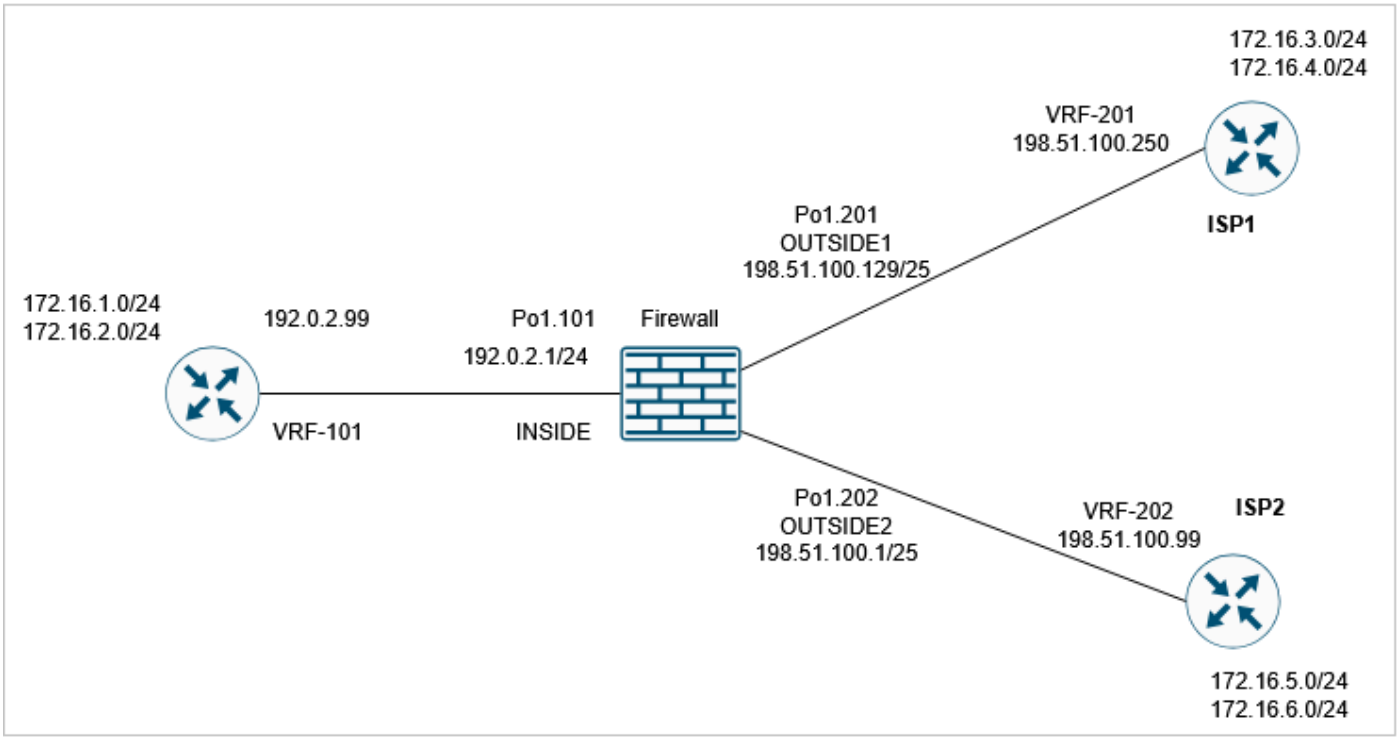
The features related to the FTD are highlighted:

Table 2. Feature Directionality

Feature	Single Interface Direction	Global Direction
Application inspection (multiple types)	Bidirectional	Ingress
NetFlow Secure Event Logging filtering	N/A	Ingress
QoS input policing	Ingress	Ingress
QoS output policing	Egress	Egress
QoS standard priority queue	Egress	Egress
TCP and UDP connection limits and timeouts, and TCP sequence number randomization	Bidirectional	Ingress
TCP normalization	Bidirectional	Ingress
TCP state bypass	Bidirectional	Ingress
User statistics for Identity Firewall	Bidirectional	Ingress

Configure

Topology



The default MPF configuration (10.0.0):

<#root>

```
firewall#
```

show run policy-map

```
!
!
policy-map type inspect dns preset_dns_map
 parameters
  message-length maximum client auto
  message-length maximum 512
  no tcp-inspection
policy-map type inspect ip-options UM_STATIC_IP_OPTIONS_MAP
 parameters
  eool action allow
  nop action allow
  router-alert action allow
policy-map global_policy
 class inspection_default
  inspect dns preset_dns_map
  inspect ftp
  inspect h323 h225
  inspect h323 ras
  inspect rsh
  inspect rtsp
  inspect sqlnet
  inspect skinny
  inspect sunrpc
  inspect sip
  inspect netbios
  inspect tftp
  inspect icmp
  inspect icmp error
  inspect ip-options UM_STATIC_IP_OPTIONS_MAP
 class class_snmp
  inspect snmp
 class class-default
  set connection advanced-options UM_STATIC_TCP_MAP

firewall#
```

show run class-map

```
!
class-map inspection_default
 match default-inspection-traffic
class-map class_snmp
 match port udp eq 4161
!
firewall#
```

show run service-policy

```
service-policy global_policy global
```

Task 1. Disable SIP inspection globally on FTD

The requirement in this task is to disable SIP inspection in the FTD LINA engine. One reason can be a policy requirement or a software defect related to SIP that affects transit traffic.

Solution

Before disabling SIP inspection first confirm that it s applied to transit traffic:

<#root>

```
firewall#

packet-tracer input INSIDE udp 172.16.1.1 5060 172.16.3.1 5060


...
Phase: 8

Type: INSPECT



Subtype: inspect-sip



Result: ALLOW


Elapsed time: 34788 ns
Config:

class-map inspection_default



 match default-inspection-traffic



policy-map global_policy



 class inspection_default



  inspect sip
```

```
service-policy global_policy global


Additional Information:
...
Result:
input-interface: INSIDE(vrfid:0)
input-status: up
input-line-status: up
output-interface: OUTSIDE1(vrfid:0)
output-status: up
output-line-status: up

Action: allow


Time Taken: 326018 ns
```

There are 2 ways to globally disable SIP inspection:

Solution 1: Disable SIP from FTD CLISH CLI

<#root>

>

```
configure inspection sip disable


Building configuration...
Cryptochecksum: ef7528dc 7338986d 6714a3a2 4770528e

7818 bytes copied in 0.250 secs
[OK]
```

Verification

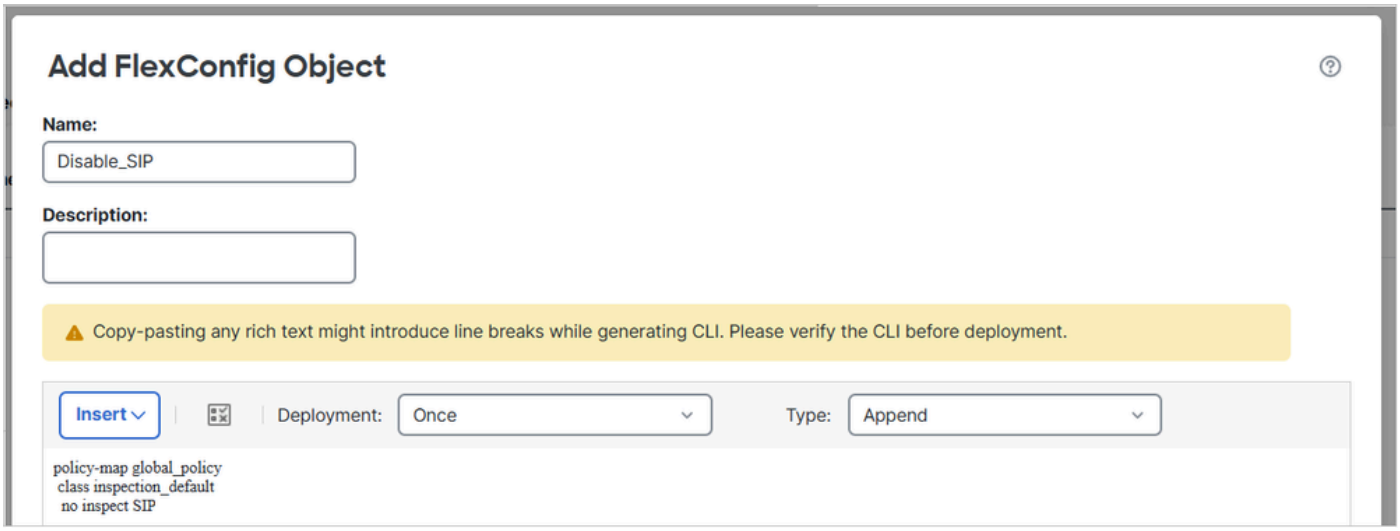
<#root>

>

```
show running-config policy-map | include sip


>
```

Solution 2: Disable SIP using FlexConfig

On FMC navigate to **Devices > FlexConfig** and create a FlexConfig object:




```
policy-map global_policy
 class inspection_default
  no inspect sip
```

Apply the FlexConfig policy and select **Preview Config** in order to preview it:

Finally, **Deploy** the policy.

Verification

<#root>

```
firewall#

show run policy-map | include sip

firewall#
```

Note – You need to clear the existing SIP connection from LINA connection table so that the connections are re-established without SIP inspection. You can use this command in order to verify the existing SIP connections:

<#root>

```
firewall#

show conn port 5060
```

Task 2. Disable SIP inspection for specific hosts

In this task the requirement is to disable SIP inspection for traffic between these networks:

- SRC: 172.16.1.0/24
- DST: 172.16.3.0/24

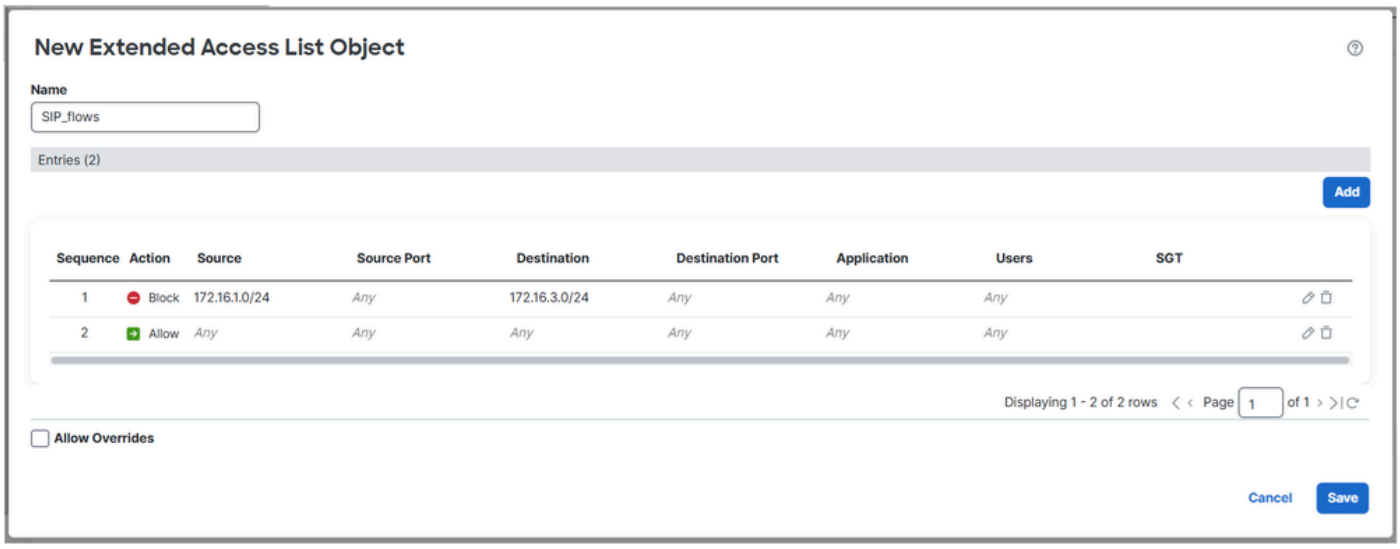
One reason to do this can be a software defect related to SIP that affects transit traffic

Solution

Use FlexConfig.

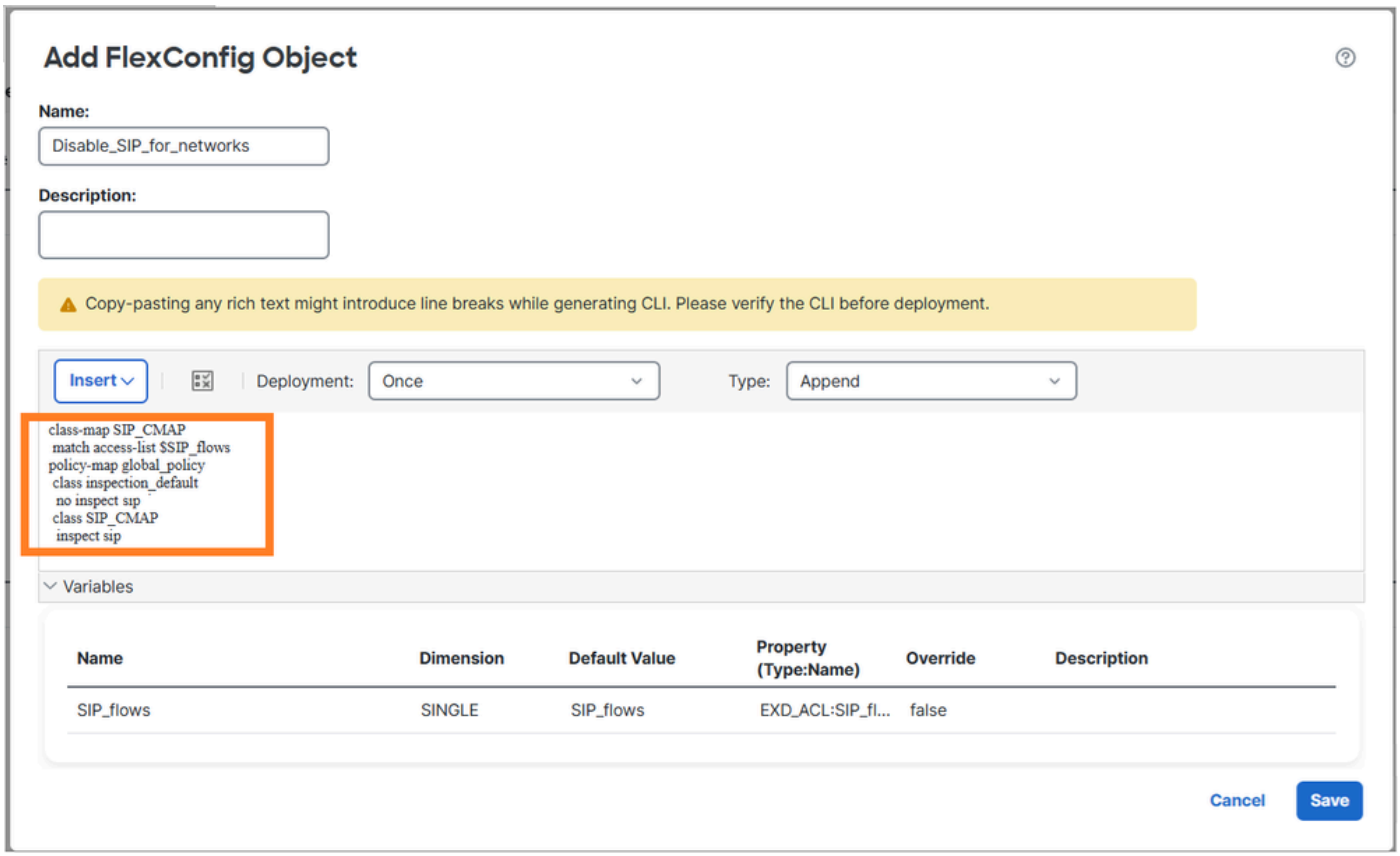
Step 1

Navigate to **Objects > Access List > Extended** and create an extended access list that matches the interesting traffic. You have to use the Block action since the goal to exclude the specific traffic. Additionally, add an Allow rule to match the rest of the traffic:



Step 2

Create a FlexConfig object with a class-map that matches the SIP Access Control List (ACL) and apply it into the global_policy:



The configured FlexConfig object:

```
class-map SIP_CMAP
 match access-list $SIP_flows
policy-map global_policy
```

```
 class inspection_default
  no inspect sip
 class SIP_CMAP
  inspect sip
```

Note

When configuring the **permit** ACL try to be **as specific as possible** (for example, put protocol ports) to avoid any potential CPU impact. The example in this task does not specify protocol ports and can be avoided in production.

Verification 1

<#root>

```
firewall#
```

show run policy-map | begin global

```
policy-map global_policy
 class inspection_default
  inspect dns preset_dns_map
  inspect ftp
  inspect h323 h225
  inspect h323 ras
  inspect rsh
  inspect rtsp
  inspect sqlnet
  inspect skinny
  inspect sunrpc
  inspect netbios
  inspect tftp
  inspect icmp
  inspect icmp error
  inspect ip-options UM_STATIC_IP_OPTIONS_MAP
 class class_snmp
  inspect snmp
```

class SIP_CMAP

inspect sip

```
 class class-default
  set connection advanced-options UM_STATIC_TCP_MAP
firewall#
```

show run class-map

```
!
class-map SIP_CMAP
 match access-list SIP_flows
class-map inspection_default
 match default-inspection-traffic
class-map class_snmp
 match port udp eq 4161
firewall#
show run access-list SIP_flows
access-list SIP_flows extended deny ip 172.16.1.0 255.255.255.0 172.16.3.0 255.255.255.0
access-list SIP_flows extended permit ip any any
```

Verification 2

Traffic that is not inspected by SIP inspection has **deny=true:**

```
<#root>
firewall#
packet-tracer input INSIDE udp 172.16.1.1 5060 172.16.3.1 5060 detail | begin INSPECT
Type: INSPECT
Subtype: inspect-sip
Result: ALLOW
Elapsed time: 37910 ns
Config:
class-map SIP_CMAP
```

```
 match access-list SIP_flows


policy-map global_policy


 class SIP_CMAP


  inspect sip


service-policy global_policy global


Additional Information:
 Forward Flow based lookup yields rule:
 in id=0x14af42cfa810, priority=70, domain=inspect-sip,

deny=true




hits=1

, user_data=0x000014af4570bea0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0


      src ip/id=172.16.1.0, mask=255.255.255.0, port=0, tag=any




      dst ip/id=172.16.3.0, mask=255.255.255.0, port=0, tag=any,


       dscp=0x0, input_ifc=INSIDE(vrfid:0), output_ifc=any
...
```

Traffic that is inspected by SIP inspection has **deny=false:**

<#root>

```
firewall#
```

```
packet-tracer input INSIDE udp 172.16.2.1 5060 172.16.3.1 5060 detail | begin INSPECT



Type: INSPECT



Subtype: inspect-sip


Result: ALLOW
Elapsed time: 34788 ns
Config:
class-map SIP_CMAP
 match access-list SIP_flows
policy-map global_policy
 class SIP_CMAP
  inspect sip
service-policy global_policy global
Additional Information:
 Forward Flow based lookup yields rule:
 in id=0x14af459099d0, priority=70, domain=inspect-sip,

deny=false


       hits=1, user_data=0x000014af4570bea0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0
       src ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any
       dst ip/id=0.0.0.0, mask=0.0.0.0, port=0, tag=any,
...
```

Verification 3

The "sip" inspect counter increases when a packet is inspected by the firewall:

```
<#root>

firewall#

show service-policy inspect sip



Global policy:
  Service-policy: global_policy
    Class-map: inspection_default
    Class-map: class_snmp
    Class-map: SIP_CMAP
      Inspect: sip ,

packet 2
```

```
, lock fail 0, drop 0, reset-drop 0, 5-min-pkt-rate 0 pkts/sec, v6-fail-close 0 sctp-drop-override 0
               tcp-proxy: bytes in buffer 0, bytes dropped 0
...
firewall#
```

```
packet-tracer input INSIDE udp 172.16.2.1 5060 172.16.3.1 5060
```

```
firewall#
```

```
show service-policy inspect sip
```

```
Global policy:
  Service-policy: global_policy
    Class-map: inspection_default
    Class-map: class_snmp
    Class-map: SIP_CMAP
      Inspect: sip ,
```

```
packet 3
```

```
, lock fail 0, drop 0, reset-drop 0, 5-min-pkt-rate 0 pkts/sec, v6-fail-close 0 sctp-drop-override 0
               tcp-proxy: bytes in buffer 0, bytes dropped 0
```

```
...
```

Task 3. Configure TCP State Bypass for specific hosts

In this task the requirement is to enable TCP state bypass for traffic between these networks:

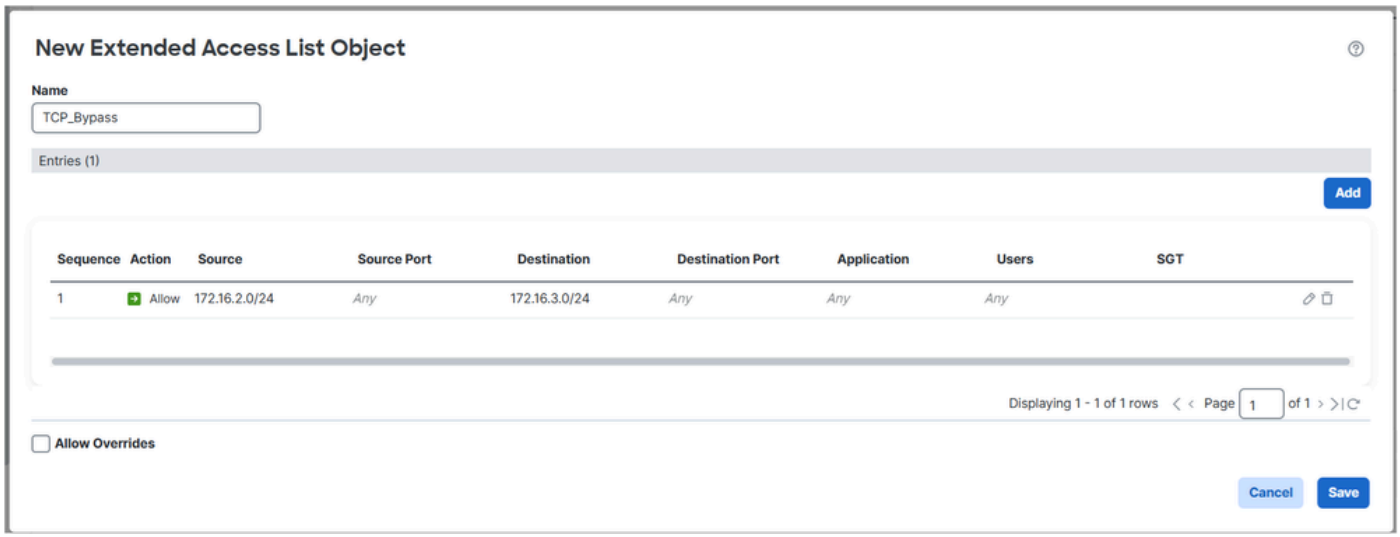
- SRC: 172.16.2.0/24
- DST: 172.16.3.0/24

In general, it is not recommended to use TCP state bypass, but it can be used as a temporary workaround for handling asymmetric flows.

Solution 1

Step 1

Create an extended ACL that matches the interesting traffic:

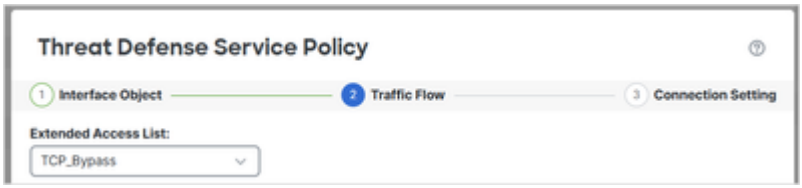


Step 2

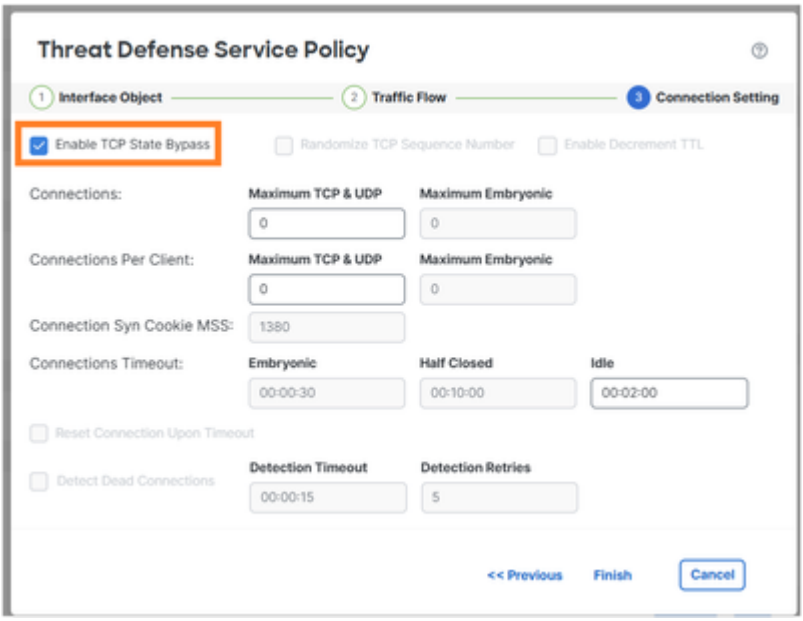
Edit the Access Control Policy (ACP) assigned to the FTD, select the **Advanced Settings** tab and edit the **Threat Defense Service Policy.** Select **Add Rule** and **Next.**

Step 3

Select the extended ACL:



Step 4



Step 5

Select **Finish, OK, Save** and **Deploy**.

The result:

<#root>

```
firewall#
```

```
show run policy-map global_policy
```

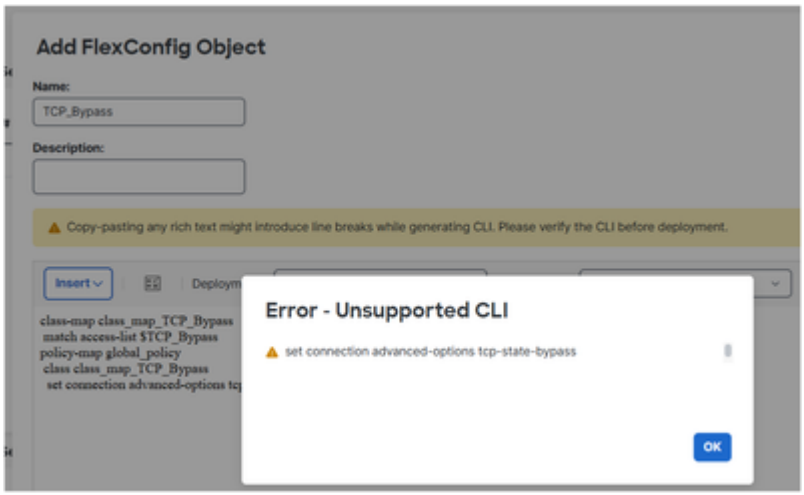
```
!
policy-map global_policy
 class inspection_default
  inspect dns preset_dns_map
  inspect ftp
  inspect h323 h225
  inspect h323 ras
  inspect rsh
  inspect rtsp
  inspect sqlnet
  inspect skinny
  inspect sunrpc
  inspect netbios
  inspect tftp
  inspect icmp
  inspect icmp error
  inspect ip-options UM_STATIC_IP_OPTIONS_MAP

 class class_map_TCP_Bypass
```

```
  set connection random-sequence-number disable
```

```
  set connection advanced-options tcp-state-bypass
```

```
class class_snmp
 inspect snmp
class class-default
 set connection advanced-options UM_STATIC_TCP_MAP
```

Note: In previous FMC releases like 6.x you can use FlexConfig to configure TCP state bypass. In newer versions this is not supported:



Verification

<#root>

```
firewall#
```

```
packet-tracer input INSIDE tcp 172.16.2.1 1111 172.16.3.1 80 detail | begin CONN
```

```
Type: CONN-SETTINGS
Subtype:
Result: ALLOW
Elapsed time: 334 ns
Config:
```

```
class-map class_map_TCP_Bypass
```

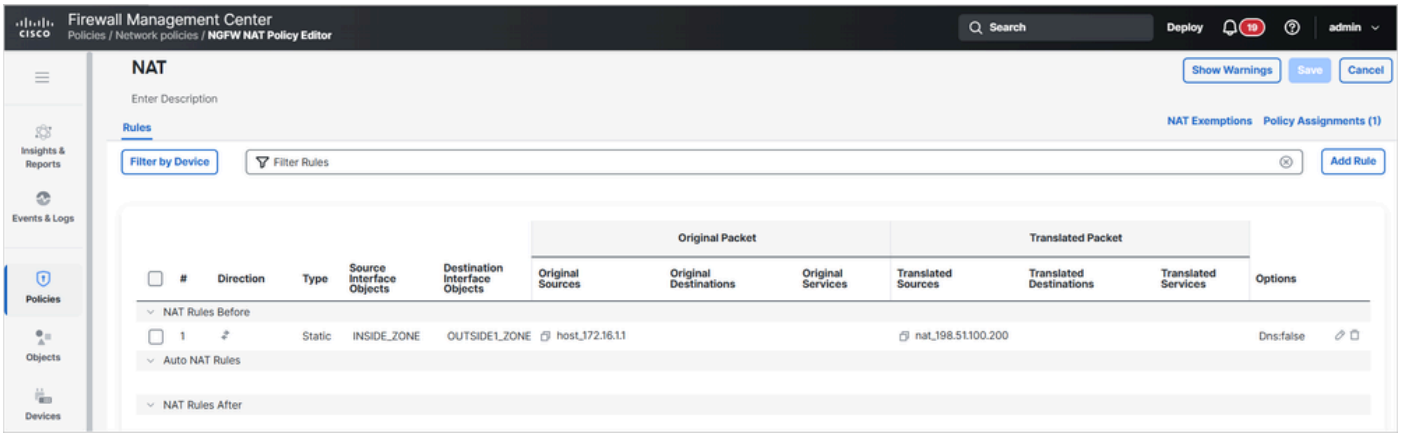
```
 match access-list TCP_Bypass
```

```
policy-map global_policy


 class class_map_TCP_Bypass


  set connection conn-max 0 embryonic-conn-max 0 random-sequence-number disable syn-cookie-mss 1380


  set connection advanced-options tcp-state-bypass


service-policy global_policy global
Additional Information:
 Forward Flow based lookup yields rule:
 in id=0x14af45906b70, priority=7, domain=conn-set, deny=false


hits=1

, user_data=0x000014af45906df0, cs_id=0x0, use_real_addr, flags=0x0, protocol=0

       src ip/id=172.16.2.0, mask=255.255.255.0, port=0, tag=any



       dst ip/id=172.16.3.0, mask=255.255.255.0, port=0, tag=any,


       dscp=0x0, input_ifc=INSIDE(vrfid:0), output_ifc=any
...
```

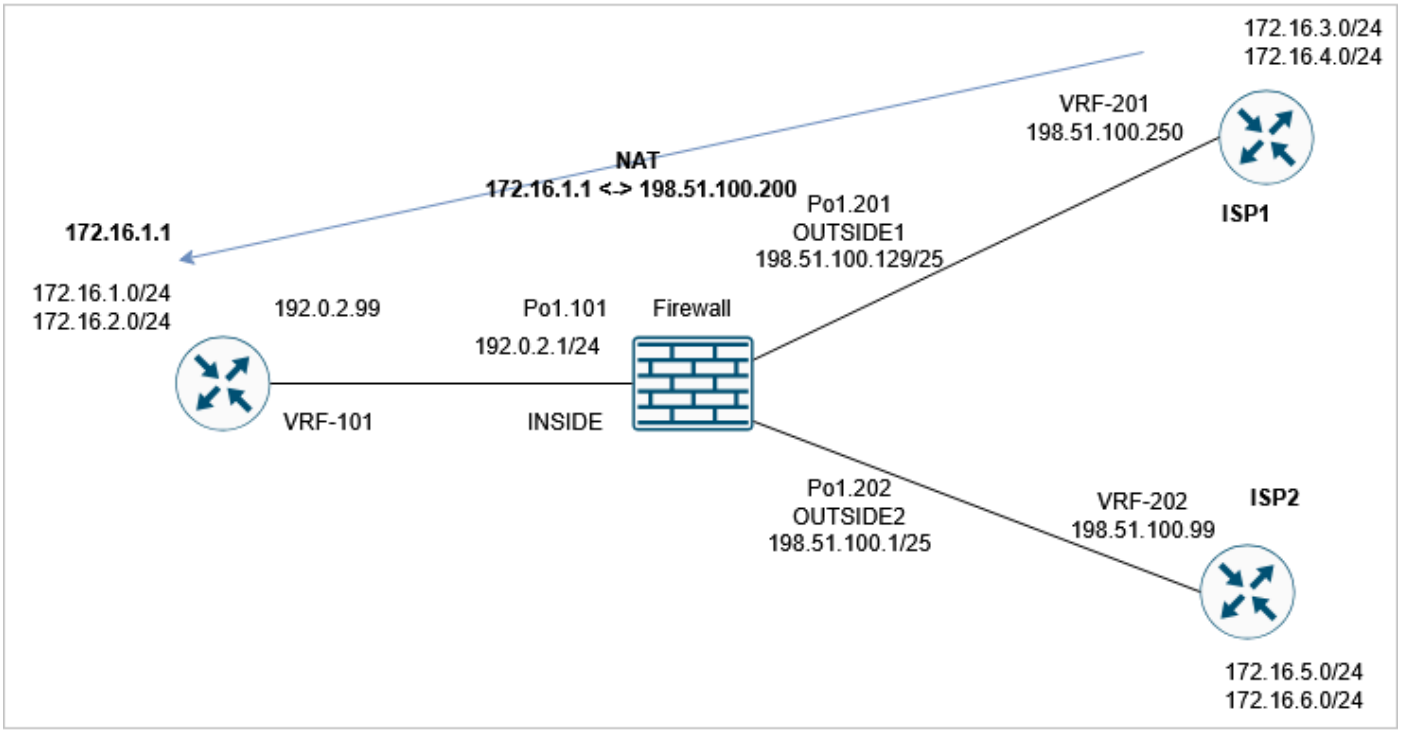
Task 4. Traceroute output modification

Prerequisite

Configure static NAT on FTD so that IP 172.16.1.1 located behind INSIDE interface appears as 198.51.100.200 on OUTSIDE1 hosts:



Then, run a traceroute from ISP1 to 198.51.100.200 (host 172.16.1.1):



<#root>

```
router1#
```

traceroute vrf VRF-201 198.51.100.200

```
Type escape sequence to abort.
Tracing the route to 198.51.100.200
VRF info: (vrf in name/id, vrf out name/id)
```

1 192.0.2.99 1 msec 1 msec *

Requirement

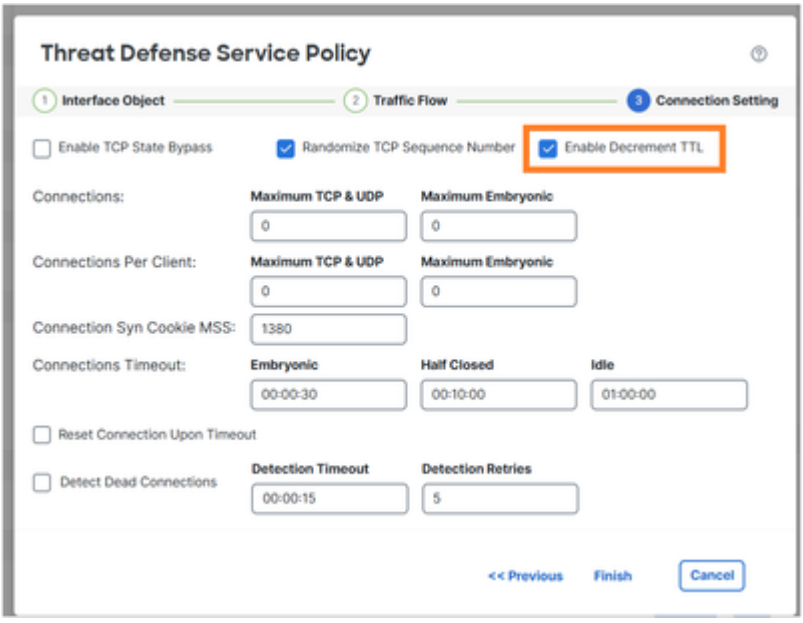
Modify the FTD configuration so that the traceroute matches this output:

<#root>

```
router1#

traceroute vrf VRF-201 198.51.100.200


Type escape sequence to abort.
Tracing the route to 198.51.100.200
VRF info: (vrf in name/id, vrf out name/id)

  1 198.51.100.129 1 msec 1 msec *



  2 198.51.100.200 1 msec 2 msec *
```

Solution

The solution includes two configuration steps:
1. Decrement the TTL:

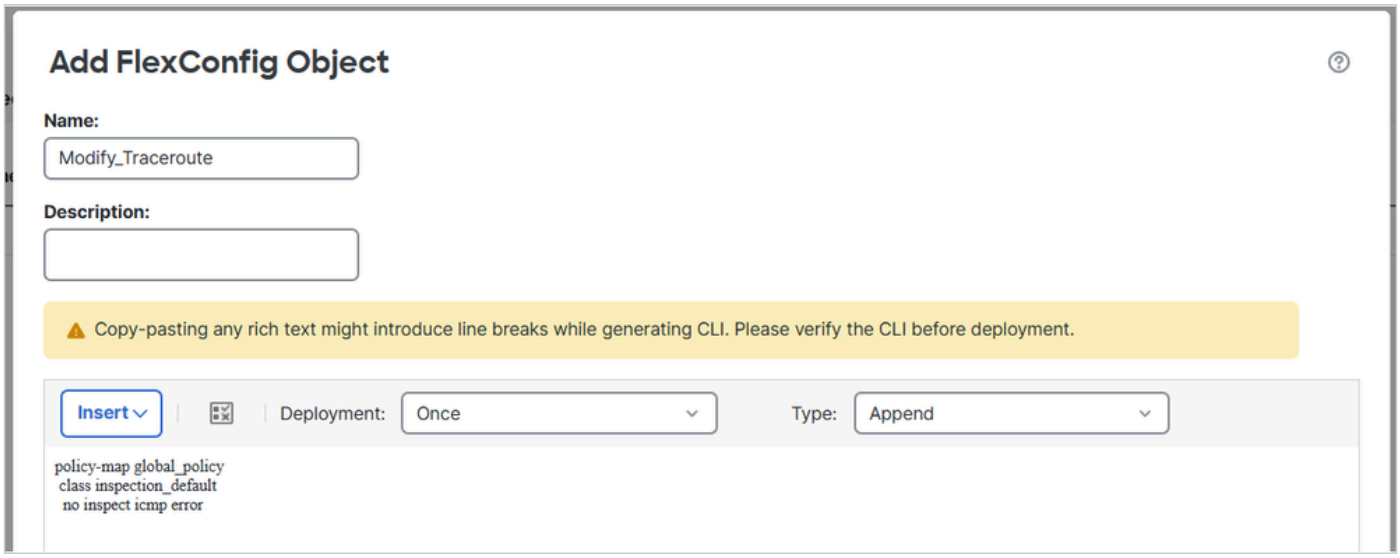


After this change, the traceroute reveals the firewall hop:

<#root>

```
router1#

traceroute vrf VRF-201 198.51.100.200


Type escape sequence to abort.
Tracing the route to 198.51.100.200
VRF info: (vrf in name/id, vrf out name/id)

 1 198.51.100.129 1 msec 1 msec *


  2 192.0.2.99 1 msec 1 msec *
```

2. Disable ICMP Error inspection:




```
policy-map global_policy
 class inspection_default
   no inspect icmp error
```

Verification

The traceroute shows the translated NAT IP address of the remote host and the FTD interface IP address:

<#root>

```
router1#
```

```
traceroute vrf VRF-201 198.51.100.200


Type escape sequence to abort.
Tracing the route to 198.51.100.200
VRF info: (vrf in name/id, vrf out name/id)

  1 198.51.100.129 1 msec 1 msec *



  2 198.51.100.200 1 msec 2 msec *
```

Task 5. Set connection timeouts

Requirement

Change the timeout to 1 week for this flow:

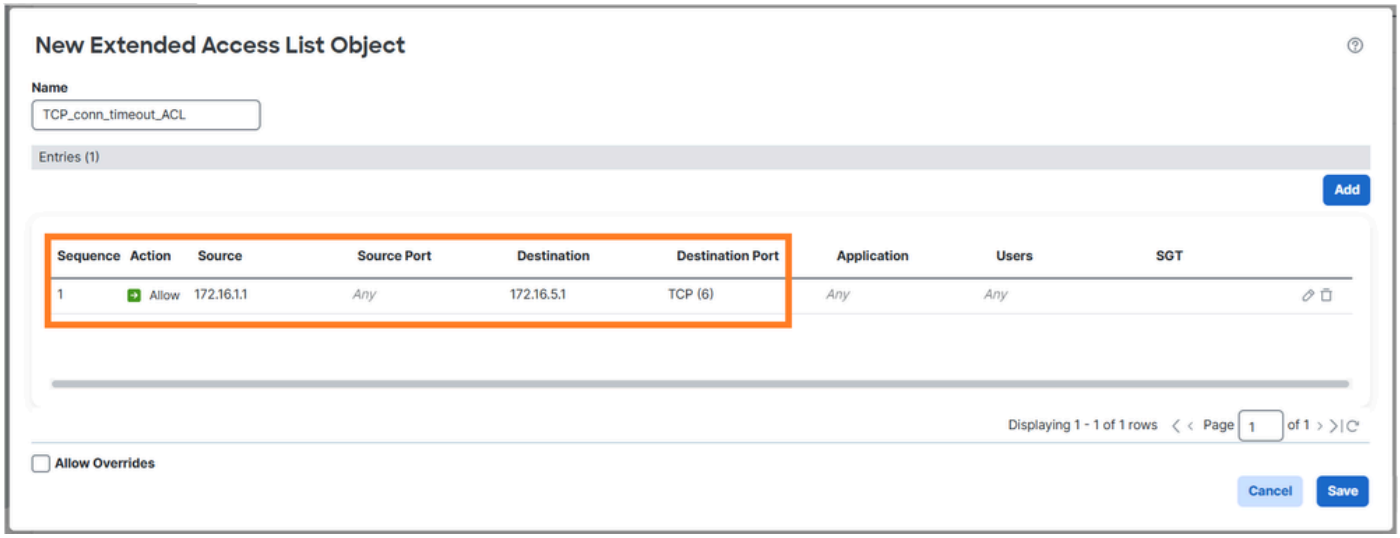
- Protocol: TCP
- SRC: 172.16.1.1
- DST: 172.16.5.1

Solution

To set timeout per flow you need to use Service Policy.

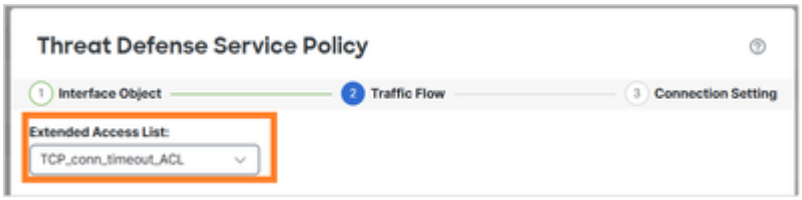
Step 1

Navigate to **Objects > Access List** and create an extended ACL that matches the interesting traffic:

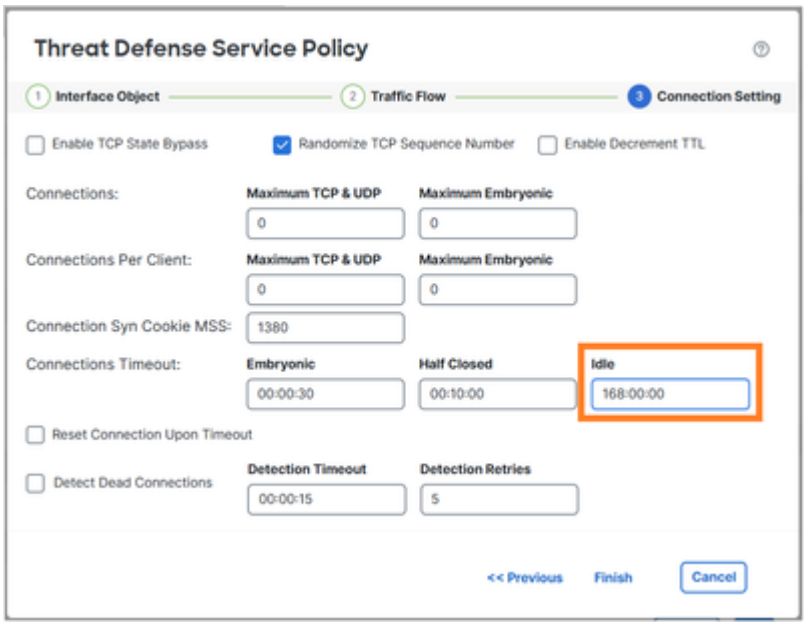


Step 2

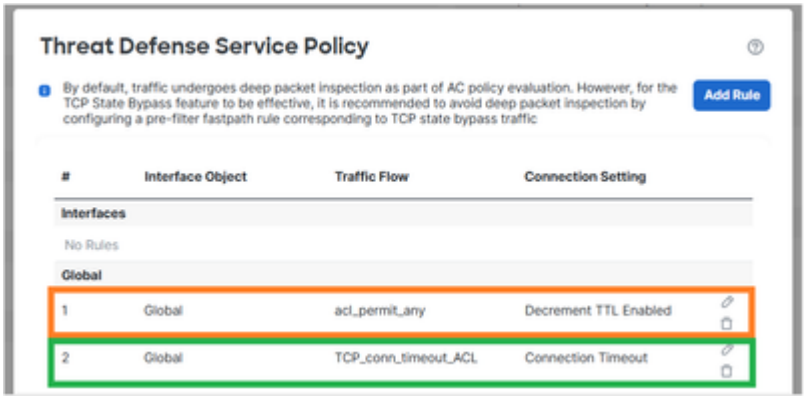
Configure an MPF policy that uses the ACL that was created in step 1:



Set the connection idle timeout:



Remove the rule from the previous task since it overlaps with the new requirement:



Verification

The deployed policy-map configuration:

<#root>

```
policy-map global_policy
 class inspection_default
  inspect dns preset_dns_map
  inspect ftp
  inspect h323 h225
  inspect h323 ras
  inspect rsh
  inspect rtsp
  inspect sqlnet
  inspect skinny
  inspect sunrpc
  inspect netbios
  inspect tftp
  inspect icmp
  inspect ip-options UM_STATIC_IP_OPTIONS_MAP
  inspect sip

 class class_map_TCP_conn_timeout_ACL



  set connection timeout idle 168:00:00


 class class_snmp
  inspect snmp
 class class-default
  set connection advanced-options UM_STATIC_TCP_MAP
```

Initiate a new TCP connection from 172.16.1.1 to 172.16.5.1 and check the connection table of the FTD:

<#root>

```
firewall#
```

```
show conn long address 172.16.5.1
```

```
...
TCP OUTSIDE2: 172.16.5.1/23 (172.16.5.1/23) INSIDE: 172.16.1.1/29389 (172.16.1.1/29389), flags UIoN1N7,
```

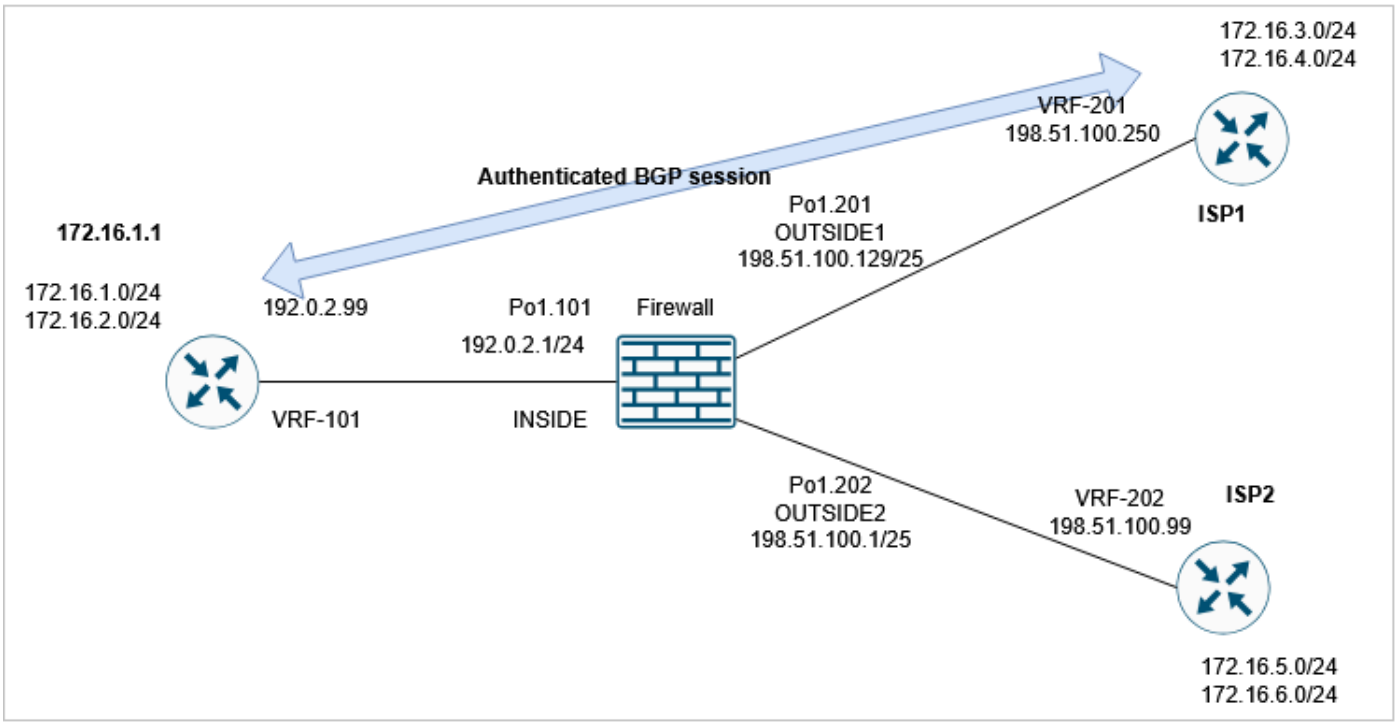
```
timeout 7D0h
```

```
, bytes 349, flow id 72, Snort id 6, rule id 268439559, Rx-RingNum 27, Internal-Data0/1
Initiator: 172.16.1.1, Responder: 172.16.5.1
Connection lookup keyid: 890
```

Task 6. BGP Authentication through FTD

Prerequisite

Configure a BGP session through the FTD. The BGP session nees to use authentication.



Verification

With the default FTD configuration, the BGP session is not established. On the router you can see:

<#root>

```
router1#
```

```
*May 21 07:51:23.595:

%TCP-6-BADAUTH: Invalid MD5 digest

 from 192.0.2.99(24591) to 198.51.100.250(179) tableid - 3
*May 21 07:51:25.595: %TCP-6-BADAUTH: Invalid MD5 digest from 192.0.2.99(24591) to 198.51.100.250(179)
*May 21 07:51:29.595: %TCP-6-BADAUTH: Invalid MD5 digest from 192.0.2.99(24591) to 198.51.100.250(179)
```

On the FTD you see that both sides fail to establish the BGP TCP connection (the connection flags denote that only TCP SYN packets are being received):

<#root>

```
firewall#

show conn port 179


3 in use, 16 most used
Inspect Snort:
        preserve-connection: 2 enabled, 0 in effect, 15 most enabled, 0 most in effect

TCP OUTSIDE1 198.51.100.250:41090 INSIDE 192.0.2.99:179, idle 0:00:00, bytes 0,

flags aA N1


TCP OUTSIDE1 198.51.100.250:179 INSIDE 192.0.2.99:53629, idle 0:00:02, bytes 0,

flags aA N1
```

Solution

To allow an authenticated BGP session through the FTD these 2 conditions must to be met:

1. TCP MD5 (option 19) must be allowed through the FTD.
2. TCP sequence number randomization must be disabled.

TCP MD5 option is allowed by default:

9.6(2)	Default handling of the named options was changed to allow a packet if it contains a single option of a given type, and drop the packet if there are more than one option of that type. Also, the **md5**, **mss**, **allow multiple**, and **mss maximum** keywords were added. The default for the MD5 option was changed from clear to allow.

<#root>

```
firewall#
```

show run all tcp-map

```
!
tcp-map UM_STATIC_TCP_MAP
  no check-retransmission
  no checksum-verification
  exceed-mss allow
  queue-limit 0 timeout 4
  reserved-bits allow
  syn-data allow
  synack-data drop
  invalid-ack drop
  seq-past-window drop
  tcp-options range 6 7 allow
  tcp-options range 9 18 allow
  tcp-options range 20 255 allow
  tcp-options selective-ack allow
  tcp-options timestamp allow
  tcp-options window-scale allow
  tcp-options mss allow
```

tcp-options md5 allow

```
  ttl-evasion-protection
  urgent-flag allow
  window-variation allow-connection
```

Globally disable TCP Initial Sequence Number (ISN) randomization:

<#root>

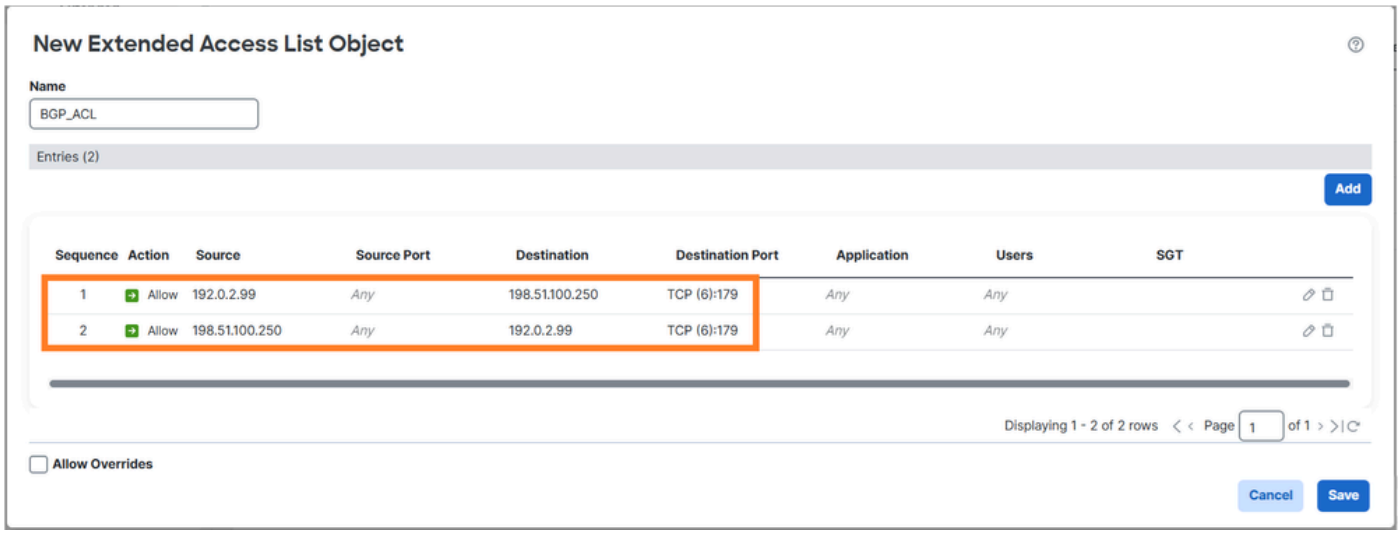
```
>
```

configure tcp-randomization disable

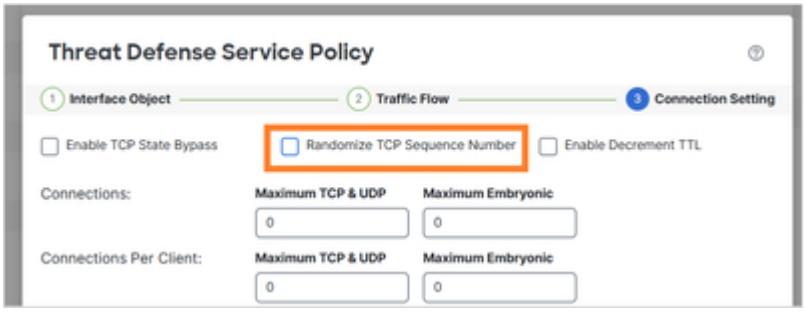
```
Building configuration...
Cryptochecksum: f8ac5587 7ccc635e bff886a1 bcab820c

8284 bytes copied in 0.260 secs
[OK]
```

>

or (the preferred method) you create an extended access list that matches the BGP connection:



and disable the TCP sequence number randomization using the Threat Defense Service Policy:



Verification

The deployed policy-map configuration:

<#root>

```
policy-map global_policy
 class inspection_default
  inspect dns preset_dns_map
  inspect ftp
  inspect h323 h225
  inspect h323 ras
  inspect rsh
  inspect rtsp
  inspect sqlnet
```

```
  inspect skinny
  inspect sunrpc
  inspect netbios
  inspect tftp
  inspect icmp
  inspect ip-options UM_STATIC_IP_OPTIONS_MAP
  inspect sip

 class class_map_BGP_ACL



  set connection random-sequence-number disable


 class class_snmp
  inspect snmp
 class class-default
  set connection advanced-options UM_STATIC_TCP_MAP
```

The BGP session is established through FTD:

<#root>

```
firewall#

show conn long port 179


...

TCP OUTSIDE1: 198.51.100.250/49863 (198.51.100.250/49863) INSIDE: 192.0.2.99/179 (192.0.2.99/179), flags

, idle 44s, uptime 1m40s, timeout 1h0m, bytes 274, flow id 111, Snort id 3, rule id 268439559, Rx-RingN


Initiator: 198.51.100.250, Responder: 192.0.2.99


  Connection lookup keyid: 83487134
```

Tip: You can configure a prefilter fastpath rule for the BGP traffic to avoid Snort inspection.

Task 7. Dead Connection Detection (DCD)

Requirement

Configure DCD on FTD for TCP traffic destined to host 172.16.3.1.

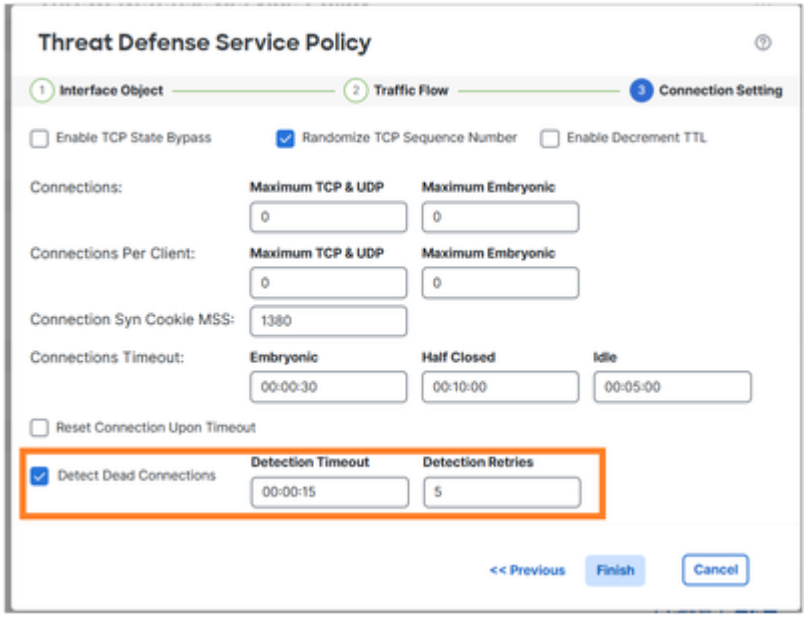
Solution

DCD is documented at:

https://www.cisco.com/c/en/us/td/docs/security/secure-firewall/management-center/device-config/100/management-center-device-config-10-0/advanced-access-service-policies.html#id_71048

1. Navigate to **Objects** > **Access-List** and create an access-list that matches the interesting traffic.

2. Edit the ACP assigned to your firewall, navigate to **Advanced** options and select **Threat Defense Service Policy** to enable DCD:



The deployed configuration:

```
access-list DCD_ACL extended permit object-group ProxySG_ExtendedACL_81604390279 any host 172.16.3.1
!
class-map class_map_DCD_ACL
 match access-list DCD_ACL
policy-map global_policy
 class class_map_DCD_ACL
  set connection timeout dcd
```

How it works

Configure FTD captures to see the backend operation:

<#root>

firewall#

capture CAPI interface INSIDE match tcp host 172.16.3.1 any

firewall#

capture CAPO interface OUTSIDE1 match tcp host 172.16.3.1 any

Establish a TCP connection through the firewall:

<#root>

firewall#

show conn long address 172.16.3.1 | begin 172.16.3.1

TCP OUTSIDE1: 172.16.3.1/23 (172.16.3.1/23) INSIDE: 192.0.2.99/23241 (192.0.2.99/23241), flags UIO N1N7

idle 1m18s

, uptime 1m22s,

timeout 5m0s

, bytes 129, flow id 127, Snort id 4, rule id 268439559, Rx-RingNum 13, Internal-Data0/1

  Initiator: 192.0.2.99, Responder: 172.16.3.1

  DCD probes sent: Initiator 0, Responder 0 Connection lookup keyid: 76292550

Initially, there are no DCD packets shown in the firewall captures:

<#root>

firewall#

show capture

capture CAPI type raw-data interface INSIDE [

```
Capturing - 0 bytes

]
  match tcp host 172.16.3.1 any
capture CAPO type raw-data interface OUTSIDE1 [

Capturing - 0 bytes

]
  match tcp host 172.16.3.1 any
```

When an idle connection reaches the idle timeout, the FTD sends **spoofed TCP ACK messages** to the source and destination:

```
<#root>

firewall#

show conn long address 172.16.3.1 | begin 172.16.3.1


TCP OUTSIDE1: 172.16.3.1/23 (172.16.3.1/23) INSIDE: 192.0.2.99/23241 (192.0.2.99/23241), flags UIO N1N7

idle 4m59s

, uptime 5m3s, timeout 5m0s, bytes 129, flow id 127, Snort id 4, rule id 268439559, Rx-RingNum 13, Inte
  Initiator: 192.0.2.99, Responder: 172.16.3.1
  DCD probes sent: Initiator 0, Responder 0 Connection lookup keyid: 76292550

firewall#

show conn long address 172.16.3.1 | begin 172.16.3.1


TCP OUTSIDE1: 172.16.3.1/23 (172.16.3.1/23) INSIDE: 192.0.2.99/23241 (192.0.2.99/23241), flags UIO N1N7

idle 0s

, uptime 5m3s, timeout 15s, bytes 129, flow id 127, Snort id 4, rule id 268439559, Rx-RingNum 13, Inter
  Initiator: 192.0.2.99, Responder: 172.16.3.1


DCD probes sent: Initiator 1

, Responder 0 Connection lookup keyid: 76292550

firewall#

 show conn long address 172.16.3.1 | begin 172.16.3.1
```

```
TCP OUTSIDE1: 172.16.3.1/23 (172.16.3.1/23) INSIDE: 192.0.2.99/23241 (192.0.2.99/23241), flags UIO N1N7
  Initiator: 192.0.2.99, Responder: 172.16.3.1
```

DCD probes sent: Initiator 1, Responder 1

```
 Connection lookup keyid: 76292550
```

If both reply, it resets the idle timer:

<#root>

```
firewall#
```

show capture CAPI

```
3 packets captured

1: 09:01:30.433952 802.1Q vlan#101 P0 172.16.3.1.23 > 192.0.2.99.23241: . ack 3271882019 win 32757
2: 09:01:30.434334 802.1Q vlan#101 P0
```

192.0.2.99.23241 > 172.16.3.1.23: . ack 1746306341 win 32746

```
3: 09:01:30.955654 802.1Q vlan#101 P0 172.16.3.1.23 > 192.0.2.99.23241: . ack 3271882019 win 32757
3 packets shown
firewall#
```

show capture CAPO

```
3 packets captured

1: 09:01:30.434364 802.1Q vlan#201 P0 192.0.2.99.23241 > 172.16.3.1.23: . ack 111661490 win 32746
2: 09:01:30.955288 802.1Q vlan#201 P0 192.0.2.99.23241 > 172.16.3.1.23: . ack 111661490 win 32746
3: 09:01:30.955639 802.1Q vlan#201 P0
```

172.16.3.1.23 > 192.0.2.99.23241: . ack 3875469573 win 32757

```
3 packets shown

firewall#
```

show conn long address 172.16.3.1 | begin 172.16.3.1

```
TCP OUTSIDE1: 172.16.3.1/23 (172.16.3.1/23) INSIDE: 192.0.2.99/23241 (192.0.2.99/23241), flags UIO N1N7
```

```
idle 1m29s

, uptime 6m33s, timeout 5m0s, bytes 129, flow id 127, Snort id 4, rule id 268439559, Rx-RingNum 13, Int
  Initiator: 192.0.2.99, Responder: 172.16.3.1
  DCD probes sent: Initiator 1, Responder 1 Connection lookup keyid: 76292550
```

Note: DCD does not work on offloaded connections ('o' flag).

Related Information

https://www.cisco.com/c/en/us/td/docs/security/secure-firewall/management-center/device-config/100/management-center-device-config-10-0/advanced-access-service-policies.html#id_71048