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Migrating ASA to Firepower Threat
Defense—Site-to-Site VPN Using IKEv2
with Certificates

September 3, 2019

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Table of Contents

Introduction	4
Existing ASA Configuration	
Verification of VPN Tunnel Status on ASA	8
Topology	10
Configuration on FTD	10
Network Diagram	10
License Verification on FMC	11
Configuration Procedure on FTD	11
Configuration on FTD Post Deployment	22

Introduction

Introduction

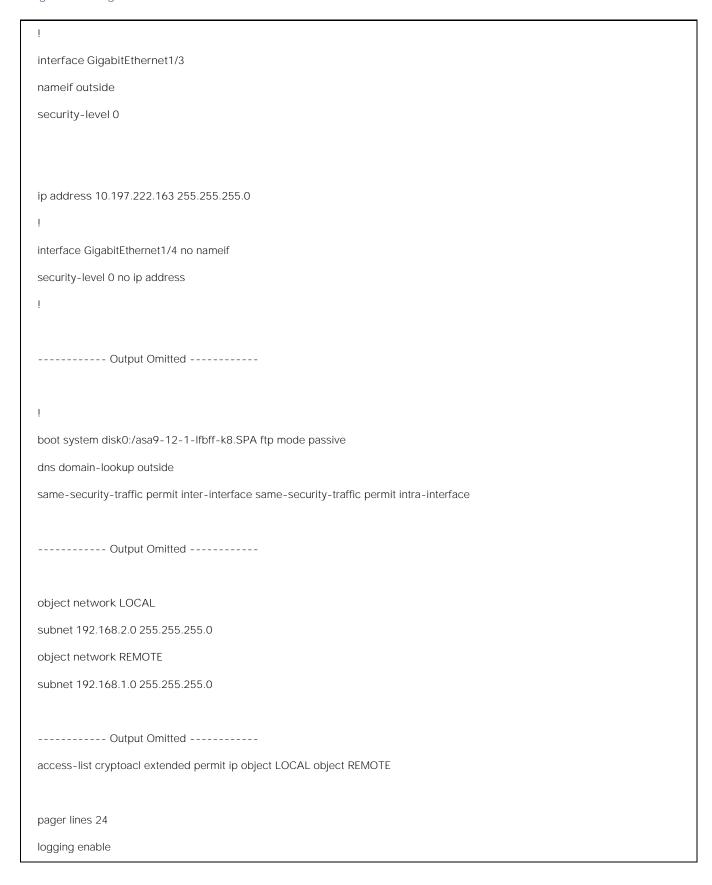
This document describes the procedure to migrate site-to-site IKEv2 VPN tunnels using certificates (rsa-sig) as a method of authentication from the existing Cisco Adaptive Security Appliance (ASA) to Firepower Threat Defense (FTD), managed by Cisco Firepower Management Center (FMC).

Existing ASA Configuration

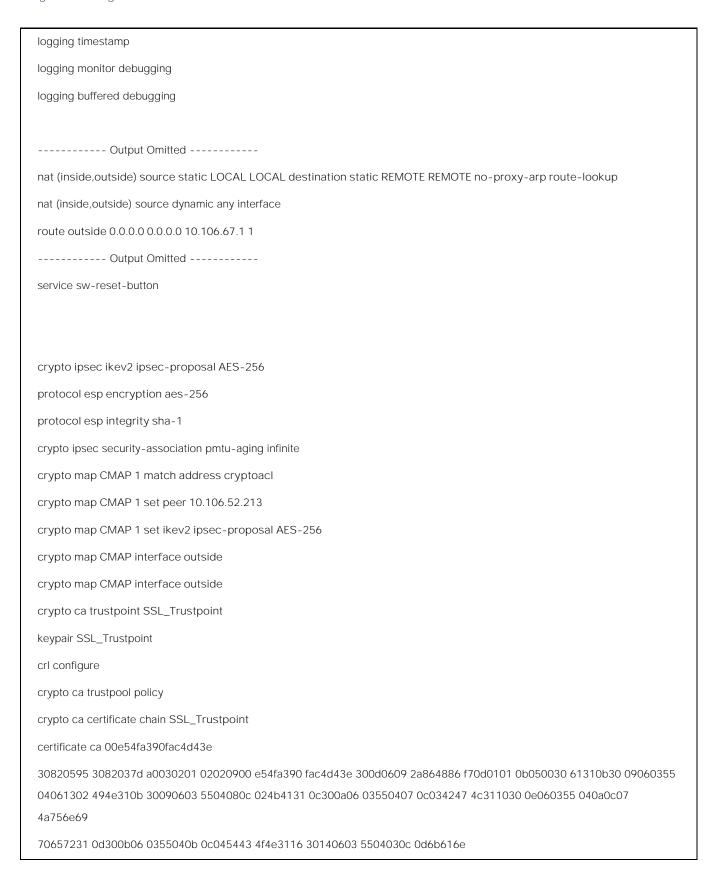
The following example illustrates a sample ASA configuration.

```
ASA# show running-config
: Saved
: Serial Number: JAD202407H5
               ASA5516, 8192 MB RAM, CPU Atom C2000 series 2416 MHz, 1 CPU (8
: Hardware:
cores)
ASA Version 9.12(1)
hostname ASA
enable password ***** pbkdf2 no mac-address auto
interface GigabitEthernet1/1
no nameif
security-level 0
no ip address
interface GigabitEthernet1/2
nameif inside
security-level 100
ip address 192.168.2.1 255.255.255.0
```

Existing ASA Configuration



Existing ASA Configuration



Existing ASA Configuration

61762e6a 756e6970 6572301e 170d3139 30343039 30393238 35355a17 0d323430

34303830 39323835 355a3061 310b3009 06035504 06130249 4e310b30 09060355

04080c02 4b41310c 300a0603 5504070c 0342474c 3110300e 06035504 0a0c074a

756e6970 6572310d 300b0603 55040b0c 0454434f 4e311630 14060355 04030c0d

6b616e61 762e6a75 6e697065 72308202 22300d06 092a8648 86f70d01 01010500

0382020f 00308202 0a028202 0100b64b 069ed584 8d7a19c8 e5536625 1c6072a4

b192c6b6 d27b4d98 2e338ede de60d119 64bc434c 11ab57ca 4c9427be b13de752 78febc9e ceecef00 fe0fedcf 0072c21a 32730cdf 73d9040d 824cdf77 39111d44 d8509087 a8f496a8 0face3d9 18bcdce2 f5a22f74 9ce4f714 fc087ad9 4c2d7ab9 a94e34c6 f5a8ba07 8b346d7d 31018005 0f410a2e db37a0fe 60664239 97405c86

55d38151 a7197a16 455d1500 5b27a43d e9cecf77 c13dc4cc a9f8e676 6dc09452 7cdfc700 9dc6a757 fb039012 10ab73cf 50d1d31d 8ce31f87 d52fa025 ed6b0436 28e51af7 9e658efd 9a44aae9 adb9daef 1e0d8521 f08394ff 3f72b6b6 70a8193a 1e4d150e 99c577ec eff22000 02d9d201 a01f8e9f 2726d0dd a57514f5 39fa9a04 4f044d6c 573ad712 8ada5006 abb91bc2 525f5930 2fa1da42 34addfb3 8ac018de

----- Output Omitted -----

231060c5 46d5ea92 856851cb cee44ff9 771a1859 bcdb3710 6abbb3c7 de976d72 64d45c4e 5374f2c7 cf8aaf3b d32a0c6f 26234ce9 1347f4cf 6db5751a df892b6a

1fbe00e9 2102b038 4c8ebcca 84f85f39 f4ca59aa 4e402ff4 3a quit

certificate 01

3082052d 30820315 02010130 0d06092a 864886f7 0d01010b 05003061 310b3009

06035504 06130249 4e310b30 09060355 04080c02 4b41310c 300a0603 5504070c

0342474c 3110300e 06035504 0a0c074a 756e6970 6572310d 300b0603 55040b0c

0454434f 4e311630 14060355 04030c0d 6b616e61 762e6a75 6e697065 72301e17

0d313930 34303930 39333434 305a170d 32313034 30383039 33343430 5a305831

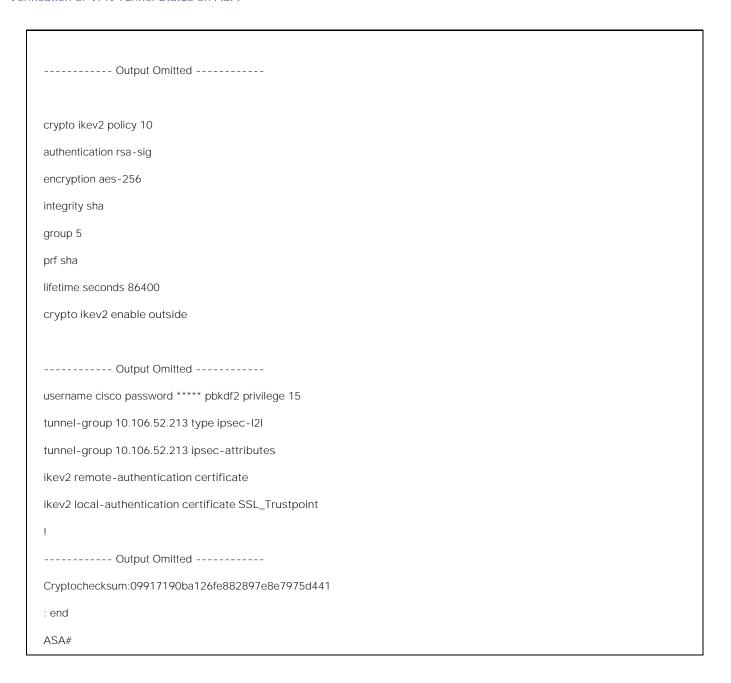
0b300906 03550406 1302494e 310b3009 06035504 080c024b 41310c30 0a060355

04070c03 42474c31 10300e06 0355040a 0c074a75 6e697065 72310d30 0b060355

040b0c04 54434f4e 310d300b 06035504 030c0469 645f3130 82022230 0d06092a

864886f7 0d010101 05000382 020f0030 82020a02 82020100 9dcaf303 ddc384d5

Verification of VPN Tunnel Status on ASA



Verification of VPN Tunnel Status on ASA

Use the following command to check the encryption and the hashing algorithms used by the tunnel during Phase 1 negotiation.

Verification of VPN Tunnel Status on ASA

ASA# show crypto ikev2 sa detail

IKEv2 SAs:

Session-id:1, Status:UP-ACTIVE, IKE count:1, CHILD count:1

Tunnel-id Local Remote

Status Role

7851179 10.197.222.163/500 10.106.52.213/500

READY RESPONDER

Encr: AES-CBC, keysize: 256, Hash: SHA96, DH Grp:5, Auth sign: RSA, Auth verify: RSA

Life/Active Time: 86400/17 sec Session-id: 1

Status Description: Negotiation done

Local spi: A31D53C12DCA9C4A Remote spi: 9D7FB57881A41D9D Local id: 10.197.222.163

Remote id: 10.106.52.213

Local req mess id: 1 Remote req mess id: 2

Local next mess id: 1 Remote next mess id: 2

Local req queued: 1 Remote req queued: 2

Local window: 1 Remote window: 5 DPD configured for 10 seconds, retry 2 $\,$

NAT-T is not detected

IKEv2 Fragmentation Configured MTU: 576 bytes, Overhead: 28 bytes,

ESP spi in/out: 0x36cdec5d/0x46a1e5ad AH spi in/out: 0x0/0x0

CPI in/out: 0x0/0x0

Encr: AES-CBC, keysize: 256, esp_hmac: SHA96 ah_hmac: None, comp: IPCOMP_NONE, mode tunnel

Parent SA Extended Status: Delete in progress: FALSE

Marked for delete: FALSE

Topology

The above example output shows site-to-site VPN configuration elements for ASA, which depicts the following topology. The example that is shown assumes that the remote peer is a Router.

Topology

Figure 1 - Topology Diagram with ASA



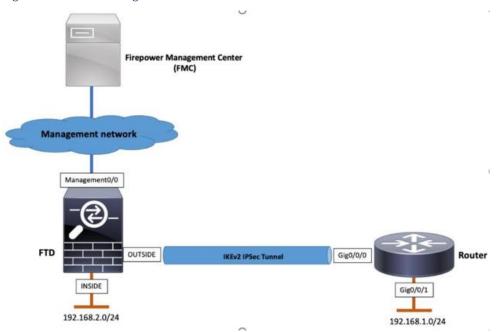
If Figure 1 is similar to the current configuration in ASA, then follow the Configuration Steps to migrate the configuration to FTD.

Note: Ensure that the required interfaces (Physical/Port-channel/Sub-Interface), Routes, NAT, Access Control Policy (ACP) are migrated properly by the Firepower Migration Tool (FMT).

Configuration on FTD

Network Diagram

Figure 2 - Network Diagram with FTD



License Verification on FMC

Ensure that the FMC is registered with the Smart Licensing Portal. In addition, ensure that Export-Controlled Features are enabled.

Figure 3 - License Verification on FMC



Configuration Procedure on FTD

- Step 1 Migrate the required certificates or Trustpoint as described in *Migrating ASA to Firepower Threat Defense Using Certificates* document.
- Step 2 Navigate to Devices > VPN > Site To Site.

Figure 4 - Create New Site To Site VPN Connection



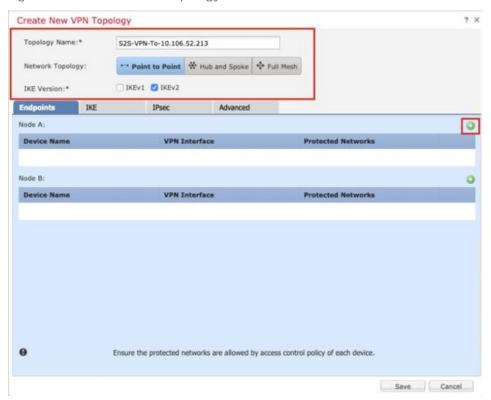
Step 3 Click Add VPN > Firepower Threat Defense Device.

Figure 5 - Type of Site to Site VPN



Step 4 Add the Topology Name, Network Topology (Point to Point), the IKE Version as IKEv2. Click the Plus (+) symbol to add a node for the VPN tunnel.

Figure 6 - Create New VPN Topology



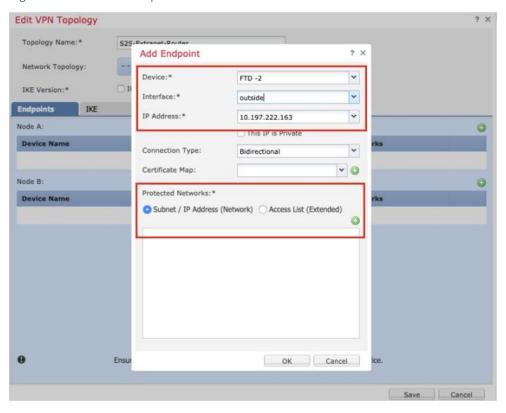
The configuration that is displayed in Figure 6 uses the following settings:

Settings	Values
Topology Name	S2S-VPN-To-10.106.52.213
Network Topology	Point to Point
IKE Version	IKEv2

Step 5 For Node A representing the local endpoint of the VPN tunnel, click the Plus (+) symbol to specify the target FTD details and perform the following:

- a. Choose Target FTD as Device.
- b. Choose the Interface on which the VPN will terminate.
- c. Select Local Network from Protected Networks.

Figure 7 - Add Local Endpoint



The configuration that is displayed in Figure 7 uses the following settings:

Settings	Values
Device	FTD-2

Settings	Values
Interface	outside
IP Address	10.197.222.163
Connection Type	Bidirectional
Protected Network	Subnet / IP Address (Network)

If you require more details on the networks that you must communicate over the VPN tunnel, use the Access List (Extended) option and define the access-list that will be used for protected networks. This functionality was added from version 6.2.3 of the EMC

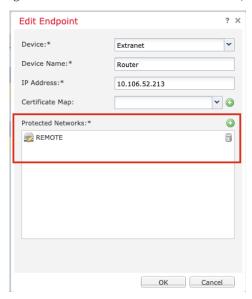
In case the ACL on the ASA makes use of objects you can use the option of Subnet/IP Address. In addition, if the ACL is more detailed, make use of the Access List (Extended) option on the FMC.

Figure 8 - Add Local Protected Network (Using Access List)



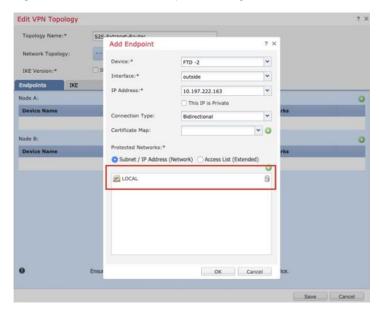
For FMC version 6.2.3 or earlier, use Protected Networks to add the Local and Remote Network Objects displayed in Figure 9.

Figure 9 - Add Local Protected Network (FMC version 6.2.3 or earlier)



Step 6 Select Local Network from Protected Networks, and click OK to save the endpoint configuration.

Figure 10 - Add Remote Endpoint (Using Subnet)

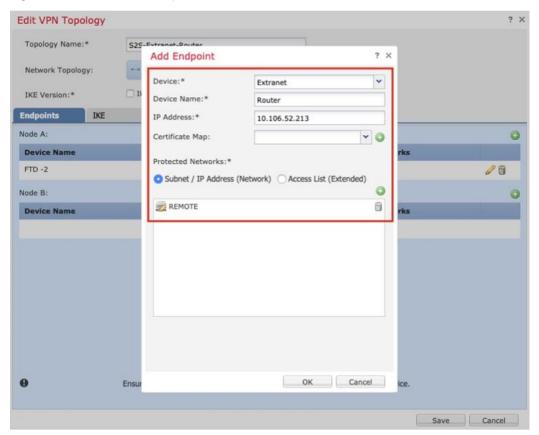


Step 7 For Node B representing the remote endpoint of the VPN tunnel, click the Plus (+) symbol to specify the remote peer details, and perform the following:

- a. Choose Extranet as Device.
- b. Enter the Device Name and WAN IP Address of the remote endpoint.
- c. Select Remote Network from Protected Networks.
- d. Click OK to save the endpoint configuration.

Note: If the peer device is managed by the same FMC, see Site-to-Site VPN for FTD managed by the same FMC.

Figure 11 - Add Remote Endpoint



Note: There is no option to configure the tunnel-group name. The FMC deploys the name of the tunnel-group as the IP address of the peer device.

The configuration that is displayed in Figure 11 uses the following settings:

Settings	Values
Device	Extranet
Device Name	Router
IP Address	10.106.52.213
Protected Network	Subnet / IP Address (Network)

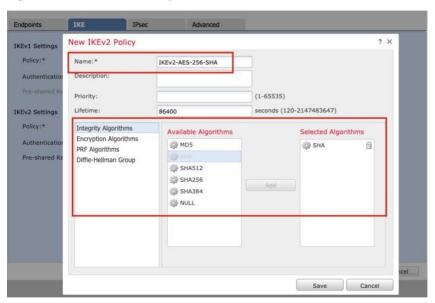
Step 8 Create a New IKEv2 Policy to match the VPN Phase 2 settings existing on the ASA.

To find the IKE policy used by the VPN tunnel, see Verification of VPN tunnel on ASA.

- a. Navigate to the IKE tab.
- b. Click the Plus (+) symbol to add a new IKEv2 Policy.

- c. Specify the IKE parameters.
- d. Click Save.

Figure 12 - New IKEv2 Policy

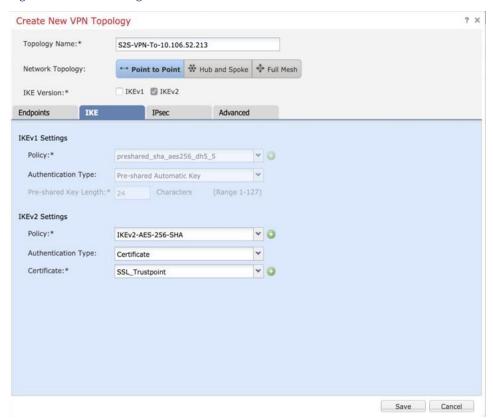


The configuration that is displayed in Figure 12 uses the following settings:

Settings	Values
Name	IKEv2-AES-256-SHA
Integrity Algorithm	SHA
Encryption Algorithm	AES-256
PRF Algorithm	SHA
Diffie-Hellman-Group	5

Step 9 Select the Policy from the drop-down to be used for the VPN tunnel. Change the Authentication Type to Certificates and proceed to select the trustpoint against Certificate option.

Figure 13 - IKE Settings

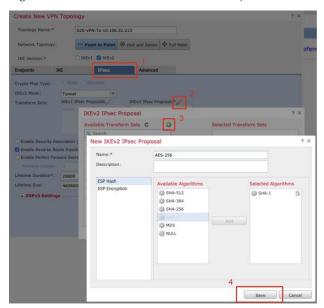


Step 10 Create a New IKEv2 IPsec Proposal to match the VPN Phase 2 settings existing on the ASA (you can also edit the default IPsec Proposal to match the parameters).

To create a new IKEv2 IPsec Proposal, perform the following:

- a. Navigate to the IPsec tab.
- b. Click Edit to edit the default IKEv2 IPsec Proposal.
- c. Click the Plus (+) symbol to add a new IKEv2 IPsec Proposal.
- d. Specify the IPsec parameters.
- e. Click Save to save the configuration.

Figure 14 - Create New IKEv2 IPsec Proposal

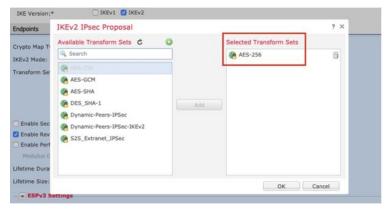


The configuration that is displayed in Figure 14 uses the following settings:

Settings	Values
Name	AES-256
ESP Hash	SHA-1
ESP Encryption	AES-256

Step 11 Select the IPsec Transform Set from the list of the Available Transform Sets.

Figure 15 - Select IKEv2 IPsec Proposal



Step 12 Confirm that the selected IKEv2 IPsec Proposal is displayed in the IKEv2 IPsec Proposals.

Figure 16 - IPsec Settings

Tunnel	~		
IKEv1 IPsec Propos	sals	IKEv2 IPsec Proposals*	
ESP-AES-SHA		AES-256	
ssociation (SA) Streng	gth Enforcer	ment	
	IKEv1 IPsec Propos ESP-AES-SHA	IKEv1 IPsec Proposals	

Step 13 Navigate to Advanced > Tunnel > Access Control for VPN Traffic.

The traffic that enters the FTD through a VPN tunnel, is subjected to access list checks by default. To bypass the interface ACL check, select the sysopt connection permit-vpn check box. Group-policy and per-user authorization access lists still apply to traffic.

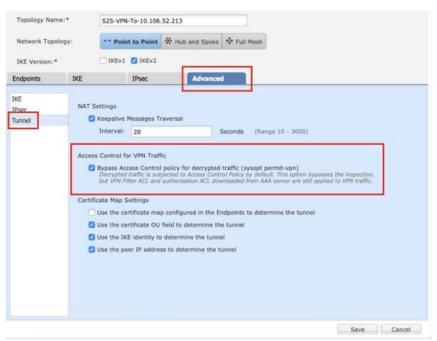
Note: By default, this setting is enabled on the ASA and is disabled on the FTD.

To get the sysopt settings on the ASA, execute the command on the ASA CLI:

ASA# show running-config all
sysopt no sysopt traffic detailed-statistics no
sysopt connection timewait
sysopt connection tcpmss 1380 sysopt connection
tcpmss minimum 0 sysopt connection permit-vpn
sysopt connection reclassify-vpn
no sysopt connection preserve-vpn-flows no sysopt
radius ignore-secret

no sysopt noproxyarp inside no sysopt
noproxyarp outside

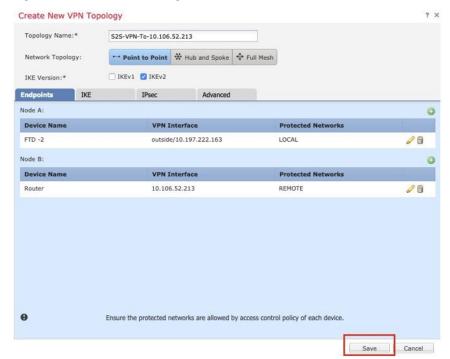
Figure 17 - Advanced VPN Tunnel Settings



This Access Control for VPN traffic bypasses the check from the WAN to LAN zone. Define access-control policy to allow traffic from the LAN to the WAN zone.

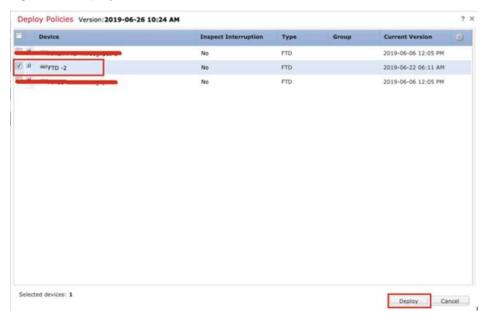
Step 14 Click Save to save the VPN tunnel configuration on the FMC.

Figure 18 - Save VPN Settings



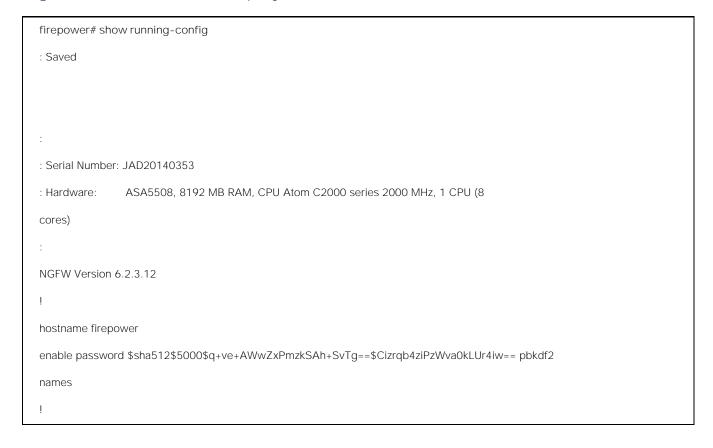
Step 15 Select the device to deploy the changes, and click Deploy.

Figure 19 - Deploy Policies

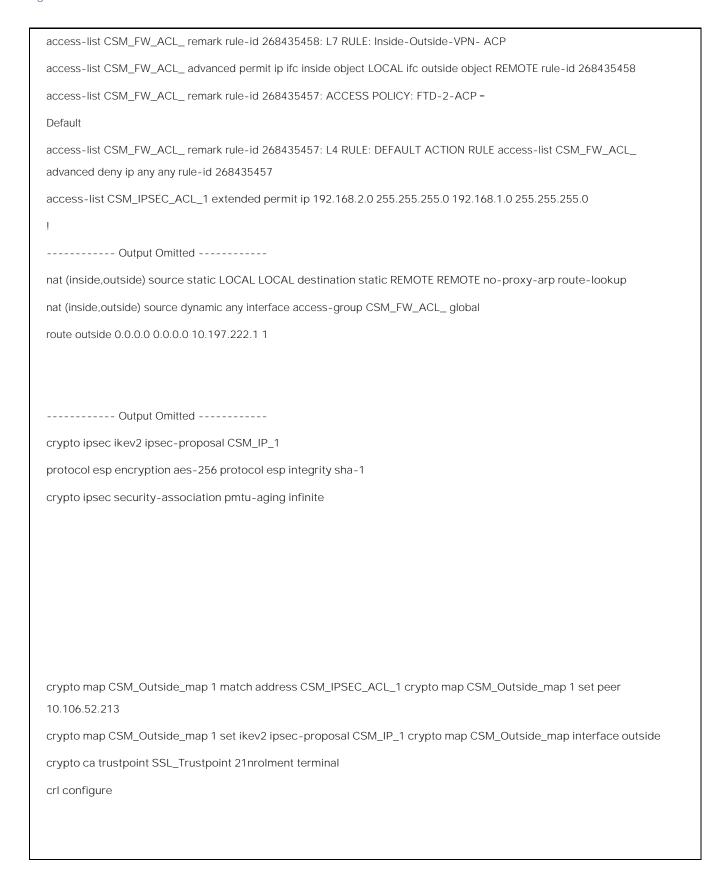


Note: Ensure that the required NAT and Access Control Policy configuration is migrated properly by the Firepower Migration Tool (FMT).

Configuration on FTD Post Deployment



```
interface GigabitEthernet1/2 nameif inside
cts manual
propagate sgt preserve-untag policy static sgt disabled trusted
security-level 100
ip address 192.168.2.1 255.255.254.0
interface GigabitEthernet1/3 nameif outside
cts manual
propagate sgt preserve-untag policy static sgt disabled trusted
security-level 0
ip address 10.197.222.163 255.255.254.0
----- Output Omitted -----
boot system disk0:/os.img
ftp mode passive
ngips conn-match vlan-id
object network LOCAL
subnet 192.168.2.0 255.255.255.0
object network REMOTE
subnet 192.168.1.0 255.255.255.0
access-list CSM_FW_ACL_ remark rule-id 9998: PREFILTER POLICY: Default Tunnel and Priority Policy
access-list CSM_FW_ACL_ remark rule-id 9998: RULE: DEFAULT TUNNEL ACTION RULE access-list CSM_FW_ACL_
advanced permit ipinip any any rule-id 9998
access-list CSM_FW_ACL_ advanced permit 41 any any rule-id 9998 access-list CSM_FW_ACL_ advanced permit gre any any
rule-id 9998
access-list CSM_FW_ACL_ advanced permit udp any eq 3544 any range 1025 65535 rule-id 9998
access-list CSM_FW_ACL_ advanced permit udp any range 1025 65535 any eq 3544 rule-id 9998
access-list CSM_FW_ACL_ remark rule-id 268435458: ACCESS POLICY: FTD-2-ACP -
Mandatory
```



crypto ca cert	ificate chain SSL_	Trustpoint				
certificate	ca 00					
		a0030201	02020100	300d0609	2a864886	f70d0101
05050		40030201	02020100	30000007	20004000	17000101
63310b30	09060355	04061302	55533121	301f0603	55040a13	18546865
20476	of20					
44616464	79204772	6f75702c2049	6e63 2e31	3130 2f06	0355 040b	1328
476f20	044					
61646479	20436c61	73732032	20436572	74696669	63617469	6f6e2041
75746	o86f					
	301e170d	30343036	32393137	30363230	5a170d33	34303632
39313	3730					
3632305a 13185	3063310b	30090603	55040613	02555331	21301f06	0355040a
Output Omitted						
e0ad595 629a	a0dcf 8882c532 0	ce42b9f 45e60d9f 2	289cb1b9 2a5a57a	id 370faf1d 7fdbbd	9f	
quit						
crypto ca cert	ificate chain SSL_	Trustpoint				
certificate ca	1be715					
3082047d 308	820365 a0030201	0202031b e71530	0d 06092a86 4886	f70d 01010b05		
00306331 0b	300906 03550406	13025553 312130	1f 06035504 0a13	1854 68652047		
		702c2049 6e632e3				
20446164 64792043 6c617373 20322043 65727469 66696361 74696f6e 20417574 Output Omitted						
	Output Offitted					
crypto ikev2	policy 10					
authenticatio	n rsa-sig					
encryption aes-256						
integrity sha						
group 5						

```
prf sha
 lifetime seconds 86400
 crypto ikev2 enable outside
 crypto ikev1 am-disable
 ----- Output Omitted -----
 tunnel-group 10.106.52.213 type ipsec-I2l tunnel-group 10.106.52.213 general-attributes
 default-group-policy .DefaultS2SgroupPolicy tunnel-group 10.106.52.213 ipsec-attributes
 ikev2 remote-authentication certificate
 ikev2 local-authentication certificate SSL_Trustpoint
 group-policy .DefaultS2SgroupPolicy internal group-policy .DefaultS2SgroupPolicy attributes
 vpn-idle-timeout 30
 vpn-idle-timeout alert-interval 1 vpn-session-timeout none
 vpn-session-timeout alert-interval 1 vpn-filter none
 vpn-tunnel-protocol ikev2
 dynamic-access-policy-record DfltAccessPolicy
 class-map inspection_default
 match default-inspection-traffic
 ----- Output Omitted -----
 Cryptochecksum:b76f6eee4099a9a021b6adb496bee827
: end firepower#
```