

Configurer FTD BGP sur VPN IPSec

Contenu

[Introduction](#)

[Conditions préalables](#)

[Conditions requises](#)

[Components Used](#)

[Configuration](#)

[Diagramme du réseau](#)

[Configuration du VPN IPSec](#)

[Configurer BGP](#)

[Configuration finale sur les deux périphériques](#)

[FTD1](#)

[FTD2](#)

[Vérification](#)

[FTD1](#)

[FTD2](#)

[Dépannage](#)

Introduction

Ce document décrit comment configurer le voisinage BGP (Border Gateway Protocol) sur un tunnel VPN site à site IPsec entre deux pare-feu Cisco FirePower Threat Defense (FTD).

Conditions préalables

Conditions requises

Cisco vous recommande de prendre connaissance des rubriques suivantes :

- Configurations BGP sur FTD
- Configurations de tunnel VPN site à site IPsec sur FTD

Components Used

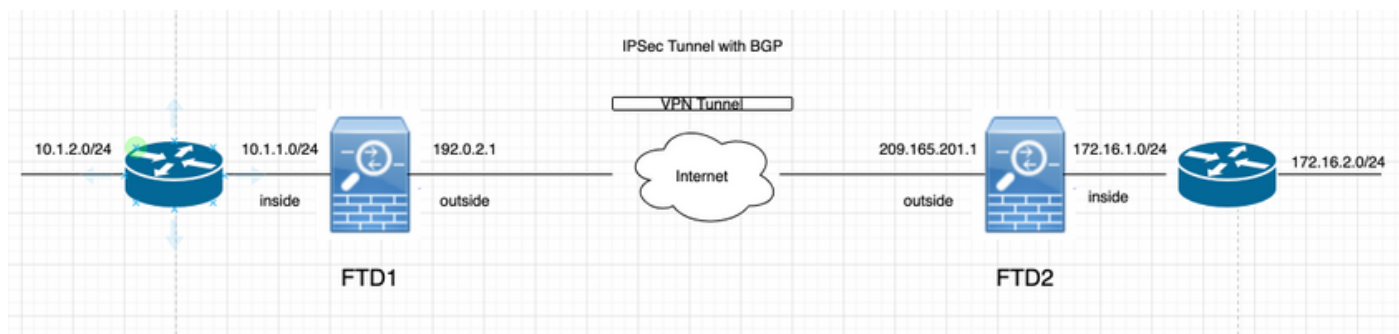
Les informations de ce document sont basées sur Cisco FTDv exécutant 6.4.0.7 et 6.4.0.9.

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, make sure that you understand the potential impact of any command.

Configuration

Cette section décrit la configuration requise sur les FTD pour activer le voisinage BGP via un tunnel IPsec.

Diagramme du réseau



Configuration du VPN IPsec

Étape 1. Créez une topologie VPN point à point.

Accédez à **Périphériques > VPN > Site-to-Site**, puis ajoutez un nouveau VPN de périphérique FirePower Threat Defense.

Create New VPN Topology

Topology Name: *

Network Topology: Point to Point Hub and Spoke Full Mesh

IKE Version: * IKEv1 IKEv2

Endpoints | IKE | IPsec | Advanced

Node A: +

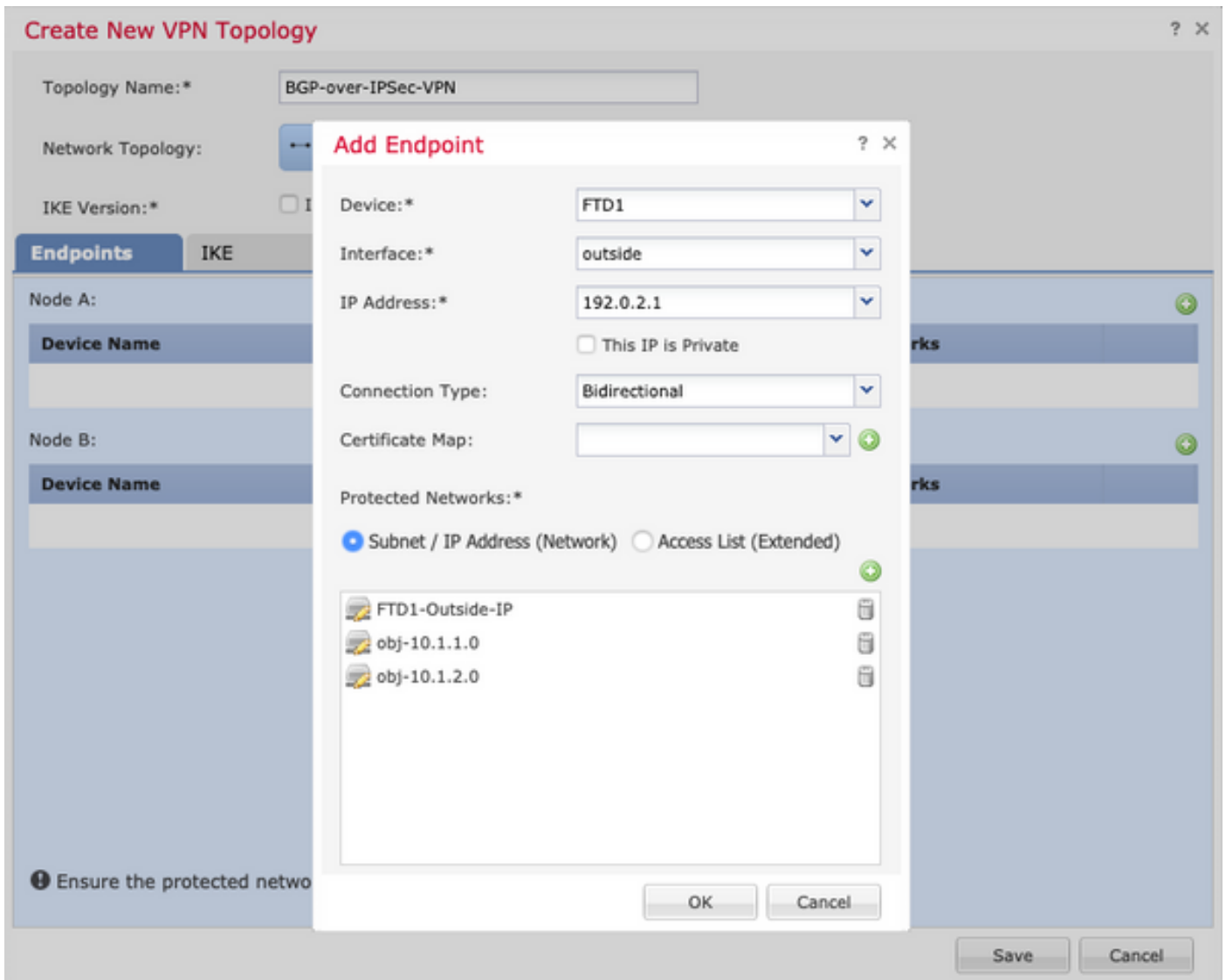
Device Name	VPN Interface	Protected Networks

Node B: +

Device Name	VPN Interface	Protected Networks

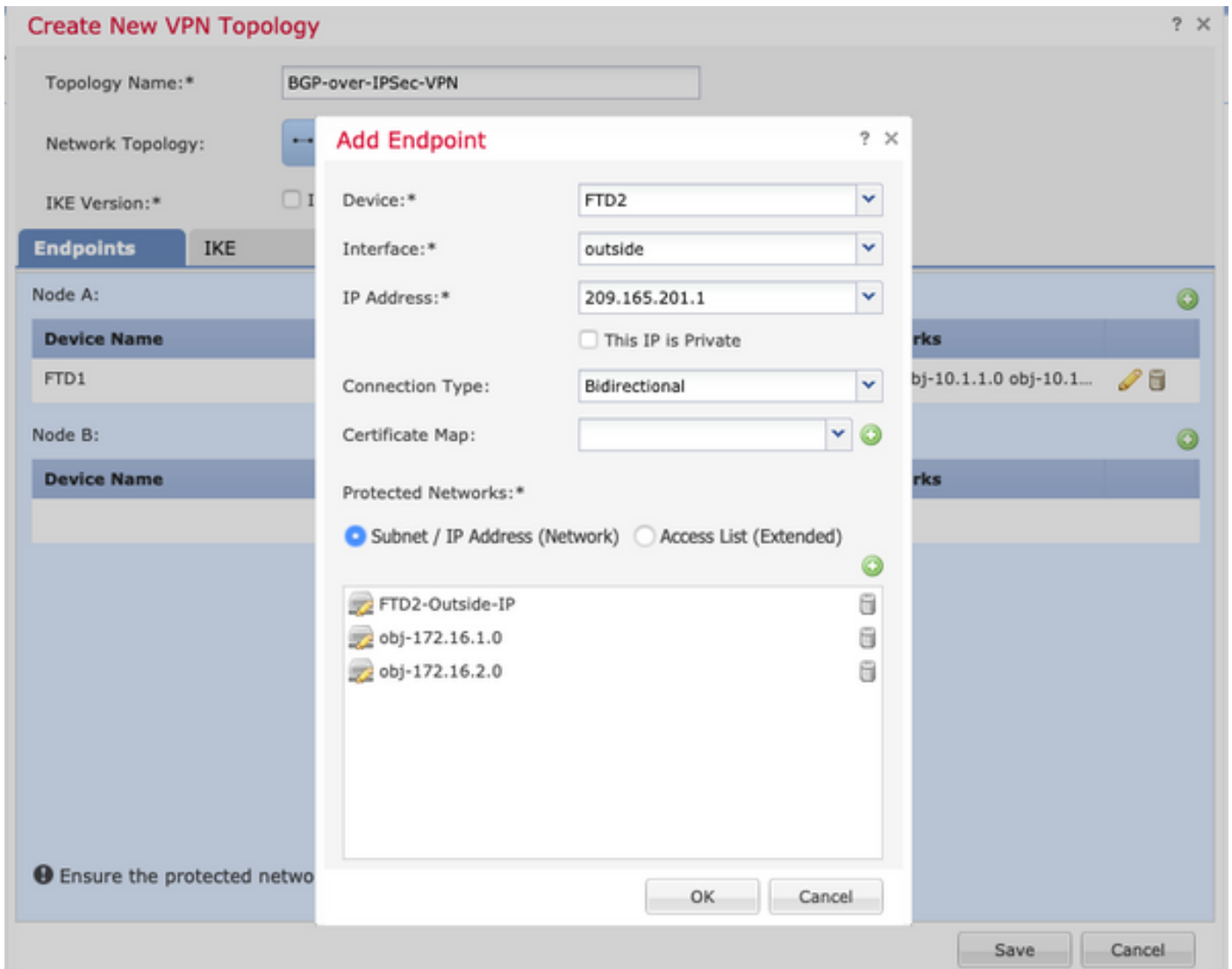
ⓘ Ensure the protected networks are allowed by access control policy of each device.

Étape 2. Configurez FTD1 comme point de terminaison.



- Le réseau d'objets FTD1-Outside-IP contient l'adresse IP de l'interface externe de FTD1.
- Les objets obj-10.1.1.0 et obj-10.1.2.0 contiennent respectivement les sous-réseaux 10.1.1.0/24 et 10.1.2.0/24. Le trafic VPN est généré à partir de ces sous-réseaux. Dans la section de configuration BGP ici, BGP est configuré pour annoncer ces sous-réseaux à ses voisins.

Étape 3. Configurez FTD2 en tant que deuxième point de terminaison.



- Le réseau d'objets FTD2-Outside-IP contient l'adresse IP de l'interface externe de FTD2.
- Les objets obj-172.16.1.0 et obj-172.16.2.0 contiennent respectivement les sous-réseaux 172.16.1.0/24 et 172.16.2.0/24. Le trafic VPN est généré à partir de ces sous-réseaux. Dans la section de configuration BGP ici, BGP est configuré pour annoncer ces sous-réseaux à ses voisins.

Étape 4. Configurez les paramètres IKE.

1. Configurez la stratégie IKEv2.
2. Configurez la méthode d'authentification (PSK/Certificate).

Create New VPN Topology

Topology Name:* BGP-over-IPSec-VPN

Network Topology: **Point to Point** Hub and Spoke Full Mesh

IKE Version:* IKEv1 IKEv2

Endpoints **IKE** IPsec Advanced

IKEv1 Settings

Policy:* preshared_sha_des_dh5_160

Authentication Type: Pre-shared Automatic Key

Pre-shared Key Length:* 24 Characters (Range 1-127)

IKEv2 Settings

Policy:* DES-SHA-SHA

Authentication Type: Pre-shared Manual Key

Key:* *****

Confirm Key:* *****

Enforce hex-based pre-shared key only

Save Cancel

Étape 5. Configurez les paramètres IPsec nécessaires.

1. Configurer le type de carte Crypto (statique ou dynamique)
2. Configurer le mode IKEv2 (tunnel ou transport)
3. Configurer les propositions IPsec
4. Activer le secret de transfert parfait (facultatif)
5. Activer l'injection de route inverse (facultatif)

Create New VPN Topology

Topology Name:*

Network Topology: Point to Point Hub and Spoke Full Mesh

IKE Version:* IKEv1 IKEv2

Endpoints | IKE | **IPsec** | Advanced

Crypto Map Type: Static Dynamic

IKEv2 Mode:

Transform Sets:

IKEv1 IPsec Proposals	IKEv2 IPsec Proposals*
tunnel_des_sha	DES_SHA-1

Enable Security Association (SA) Strength Enforcement

Enable Reverse Route Injection

Enable Perfect Forward Secrecy

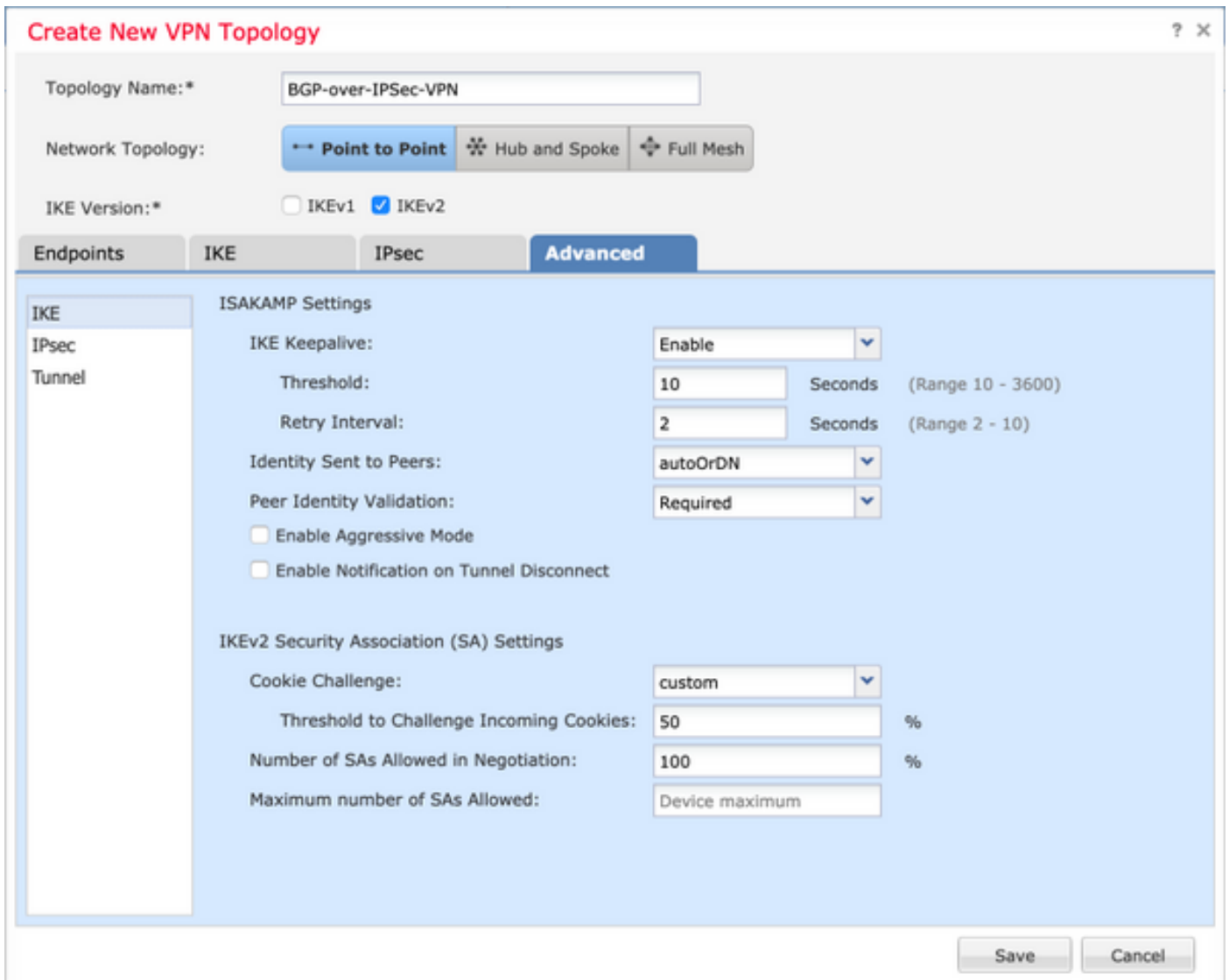
Modulus Group:

Lifetime Duration*: Seconds (Range 120-2147483647)

Lifetime Size: Kbytes (Range 10-2147483647)

ESPv3 Settings

Étape 6. Configurez les paramètres avancés si nécessaire.

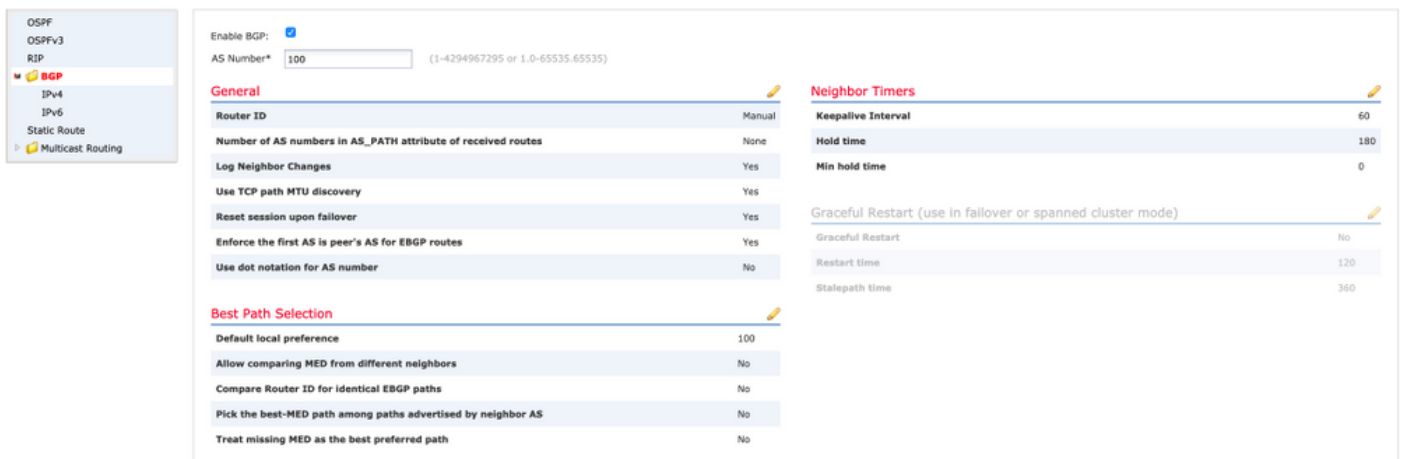


Configurer BGP

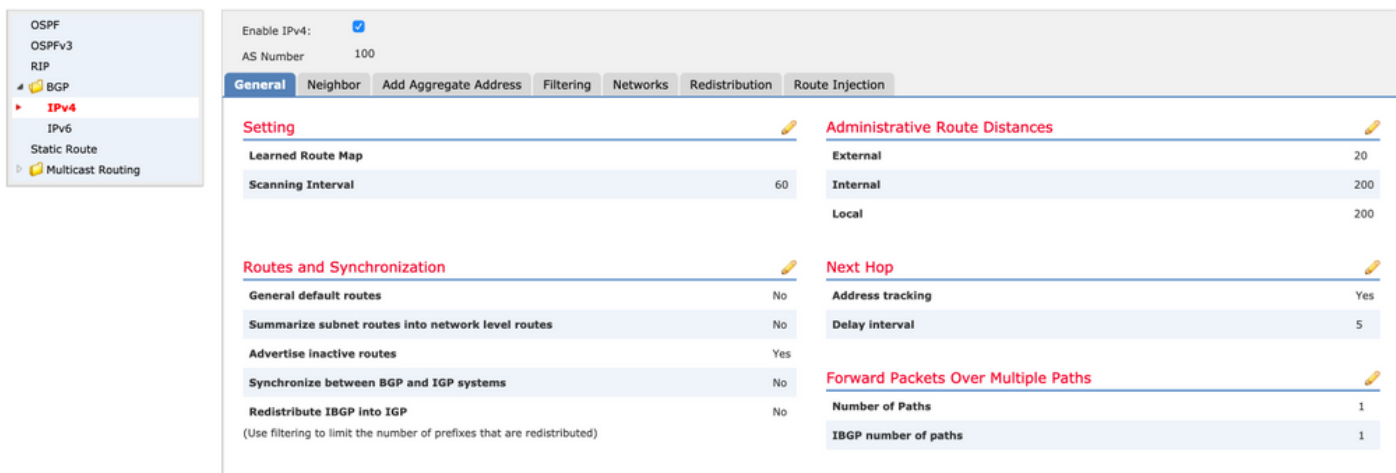
Voici la procédure à suivre pour configurer FTD1 et FTD2.

Sous **Device Management** et sélectionnez le périphérique, puis accédez à **Routing > BGP**.

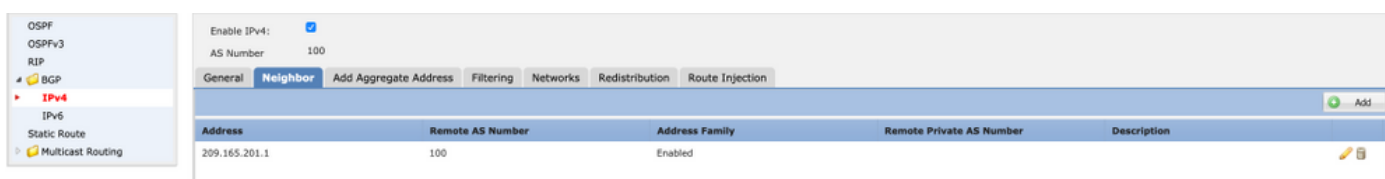
1. Activez BGP et configurez le numéro de système autonome (AS), comme illustré dans cette image.



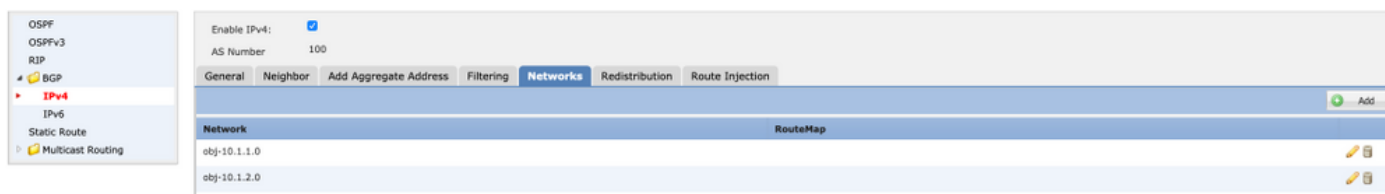
2. Accédez à **BGP > IPv4** et activez BGP IPv4 sur le FTD, comme illustré dans cette image.



3. Sous l'onglet **Voisin**, ajoutez l'autre FTD en tant que voisin et activez le voisin, comme illustré dans cette image.



4. Sous l'onglet **Réseaux**, ajoutez les réseaux que vous souhaitez annoncer via BGP.



5. Tous les autres paramètres BGP sont facultatifs et vous pouvez les configurer conformément à votre environnement.

Configuration finale sur les deux périphériques

FTD1

```
!--- FTD Version ---! ftd1# show version -----[ ftd1 ]-----
Model : Cisco Firepower Threat Defense for VMWare (75) Version 6.4.0.7 (Build 53) UUID :
cbd4966c-daf4-11ea-8637-c8977622bc2d Rules update version : 2018-10-10-001-vrt VDB version : 309
----- Cisco Adaptive Security Appliance Software
Version 9.12(2)151 !--- Configure the Inside and outside interface ---! interface
GigabitEthernet0/0 nameif outside cts manual propagate sgt preserve-untag policy static sgt
disabled trusted security-level 0 ip address 192.0.2.1 255.255.255.0 ! interface
GigabitEthernet0/1 nameif inside cts manual propagate sgt preserve-untag policy static sgt
disabled trusted security-level 0 ip address 10.1.1.1 255.255.255.0 !--- Configure VPN ---! !---
Configure IPsec Policy ---! crypto ipsec ikev2 ipsec-proposal CSM_IP_1 protocol esp encryption
des protocol esp integrity sha-1 !--- Configure Crypto Map ---! crypto map CSM_outside_map 1
match address CSM_IPSEC_ACL_2 crypto map CSM_outside_map 1 set peer 209.165.201.1 crypto map
CSM_outside_map 1 set ikev2 ipsec-proposal CSM_IP_1 crypto map CSM_outside_map 1 set reverse-
route !--- Apply the Crypto Map to the outside interface ---! crypto map CSM_outside_map
interface outside !--- Configure IKEv2 policy ---! crypto ikev2 policy 80 encryption des
integrity sha group 5 prf sha lifetime seconds 86400 !--- Enable IKEv2 on the outside interface
---! crypto ikev2 enable outside !--- Configure BGP Router Process ---! router bgp 100 bgp log-
```



```
neighbor-changes bgp router-id 10.127.248.35 address-family ipv4 unicast neighbor 209.165.201.1
remote-as 100 neighbor 209.165.201.1 transport path-mtu-discovery disable neighbor 209.165.201.1
activate network 10.1.1.0 mask 255.255.255.0 network 10.1.2.0 mask 255.255.255.0 no auto-summary
no synchronization exit-address-family !!-- Configure the necessary routes ---! route outside
0.0.0.0 0.0.0.0 192.0.2.100 1 route inside 10.1.2.0 255.255.255.0 10.1.1.100 1
```

FTD2

```
!--- FTD Version ---! ftd2# show version -----[ ftd2 ]-----
Model : Cisco Firepower Threat Defense for VMWare (75) Version 6.4.0.9 (Build 62) UUID :
4ebe8e3a-dd8d-11ea-a599-a348a450d5ff Rules update version : 2018-10-10-001-vrt VDB version : 309
----- Cisco Adaptive Security Appliance Software
Version 9.12(2)33 !!-- Configure the Inside and outside interface ---! interface
GigabitEthernet0/0 nameif outside cts manual propagate sgt preserve-untag policy static sgt
disabled trusted security-level 0 ip address 209.165.201.1 255.255.255.0 ! interface
GigabitEthernet0/1 nameif inside cts manual propagate sgt preserve-untag policy static sgt
disabled trusted security-level 0 ip address 172.16.1.1 255.255.255.0 !!-- Configure VPN ---! -
-- Configure IPSec Policy ---! crypto ipsec ikev2 ipsec-proposal CSM_IP_1 protocol esp
encryption des protocol esp integrity sha-1 !!-- Configure Crypto Map ---! crypto map
CSM_outside_map 2 match address CSM_IPSEC_ACL_2 crypto map CSM_outside_map 2 set peer 192.0.2.1
crypto map CSM_outside_map 2 set ikev2 ipsec-proposal CSM_IP_1 crypto map CSM_outside_map 2 set
reverse-route !!-- Apply the Crypto Map to the outside interface ---! crypto map CSM_outside_map
interface outside !!-- Configure IKEv2 policy ---! crypto ikev2 policy 80 encryption des
integrity sha group 5 prf sha lifetime seconds 86400 !!-- Enable IKEv2 on the outside interface
---! crypto ikev2 enable outside !!-- Configure BGP Router Process ---! router bgp 100 bgp log-
neighbor-changes bgp router-id 10.127.248.36 address-family ipv4 unicast neighbor 192.0.2.1
remote-as 100 neighbor 192.0.2.1 transport path-mtu-discovery disable neighbor 192.0.2.1
activate network 172.16.1.0 mask 255.255.255.0 network 172.16.2.0 mask 255.255.255.0 no auto-
summary no synchronization exit-address-family !!-- Configure the necessary routes ---! route
outside 0.0.0.0 0.0.0.0 209.165.201.100 1 route inside 172.16.2.0 255.255.255.0 172.16.1.100 1
```

Vérification

FTD1

```
!--- Check the IKEv2 sa with remote peer ---! ftd1# show crypto ikev2 sa IKEv2 SAs: Session-
id:34, Status:UP-ACTIVE, IKE count:1, CHILD count:1 Tunnel-id Local Remote Status Role 315310279
192.0.2.1/500 209.165.201.1/500 READY INITIATOR Encr: DES, Hash: SHA96, DH Grp:5, Auth sign:
PSK, Auth verify: PSK Life/Active Time: 86400/32514 sec Child sa: local selector 192.0.2.1/0 -
192.0.2.1/65535 remote selector 209.165.201.1/0 - 209.165.201.1/65535 ESP spi in/out:
0xd8ba0545/0x4b6beb6c !!-- Check the IPSec sa with remote peer and check the number of encrypts
and decrypts---! ftd1# show crypto ipsec sa interface: outside Crypto map tag: CSM_outside_map,
seq num: 1, local addr: 192.0.2.1 access-list CSM_IPSEC_ACL_2 extended permit ip host 192.0.2.1
host 209.165.201.1 local ident (addr/mask/prot/port): (192.0.2.1/255.255.255.255/0/0) remote
ident (addr/mask/prot/port): (209.165.201.1/255.255.255.255/0/0) current_peer: 209.165.201.1
#pkts encaps: 1110, #pkts encrypt: 1110, #pkts digest: 1110 #pkts decaps: 1111, #pkts decrypt:
1111, #pkts verify: 1111 #pkts compressed: 0, #pkts decompressed: 0 #pkts not compressed: 1110,
#pkts comp failed: 0, #pkts decomp failed: 0 #pre-frag successes: 0, #pre-frag failures: 0,
#fragments created: 0 #PMTUs sent: 0, #PMTUs rcvd: 0, #decapsulated frgs needing reassembly: 0
#TFC rcvd: 0, #TFC sent: 0 #Valid ICMP Errors rcvd: 0, #Invalid ICMP Errors rcvd: 0 #send
errors: 0, #recv errors: 0 local crypto endpt.: 192.0.2.1/500, remote crypto endpt.:
209.165.201.1/500 path mtu 1500, ipsec overhead 58(36), media mtu 1500 PMTU time remaining
(sec): 0, DF policy: copy-df ICMP error validation: disabled, TFC packets: disabled current
outbound spi: 4B6BEB6C current inbound spi : D8BA0545 inbound esp sas: spi: 0xD8BA0545
(3636069701) SA State: active transform: esp-des esp-sha-hmac no compression in use settings
={L2L, Tunnel, IKEv2, } slot: 0, conn_id: 1515, crypto-map: CSM_outside_map sa timing: remaining
key lifetime (kB/sec): (4101105/21619) IV size: 8 bytes replay detection support: Y Anti replay
bitmap: 0xFFFFFFFF 0xFFFFFFFF outbound esp sas: spi: 0x4B6BEB6C (1265363820) SA State: active
transform: esp-des esp-sha-hmac no compression in use settings ={L2L, Tunnel, IKEv2, } slot: 0,
conn_id: 1515, crypto-map: CSM_outside_map sa timing: remaining key lifetime (kB/sec):
```

```

(4239345/21619) IV size: 8 bytes replay detection support: Y Anti replay bitmap: 0x00000000
0x00000001 !--- Check the BGP router summary ---! ftd1# show bgp summary BGP router identifier
10.127.248.35, local AS number 100 BGP table version is 43, main routing table version 43 4
network entries using 800 bytes of memory 4 path entries using 320 bytes of memory 2/2 BGP
path/bestpath attribute entries using 416 bytes of memory 0 BGP route-map cache entries using 0
bytes of memory 0 BGP filter-list cache entries using 0 bytes of memory BGP using 1536 total
bytes of memory BGP activity 20/16 prefixes, 26/22 paths, scan interval 60 secs Neighbor V AS
MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd 209.165.201.1 4 100 494 488 43 0 0 09:01:15
2 !--- Check the BGP neighborhood ---! ftd1# show bgp neighbors BGP neighbor is 209.165.201.1,
context single_vf, remote AS 100, internal link BGP version 4, remote router ID 10.127.248.36
BGP state = Established, up for 09:01:18 Last read 00:00:52, last write 00:00:12, hold time is
180, keepalive interval is 60 seconds Neighbor sessions: 1 active, is not multisession capable
(disabled) Neighbor capabilities: Route refresh: advertised and received(new) Four-octets ASN
Capability: advertised and received Address family IPv4 Unicast: advertised and received
Multisession Capability: Message statistics: InQ depth is 0 OutQ depth is 0 Sent Rcvd Opens: 1 1
Notifications: 0 0 Updates: 3 3 Keepalives: 484 490 Route Refresh: 0 0 Total: 488 494 Default
minimum time between advertisement runs is 0 seconds For address family: IPv4 Unicast Session:
209.165.201.1 BGP table version 43, neighbor version 43/0 Output queue size : 0 Index 19 19
update-group member Sent Rcvd Prefix activity: ---- ---- Prefixes Current: 2 2 (Consumes 160
bytes) Prefixes Total: 2 2 Implicit Withdraw: 0 0 Explicit Withdraw: 0 0 Used as bestpath: n/a 2
Used as multipath: n/a 0 Outbound Inbound Local Policy Denied Prefixes: -----
Bestpath from this peer: 2 n/a Invalid Path: 1 n/a Total: 3 0 Number of NLRI in the update
sent: max 1, min 0 Address tracking is enabled, the RIB does have a route to 209.165.201.1
Connections established 2; dropped 1 Last reset 09:01:34, due to Peer closed the session of
session 1 Transport(tcp) path-mtu-discovery is disabled Graceful-Restart is disabled !--- Check
the routes learned from BGP ---! ftd1# sh route bgp Codes: L - local, C - connected, S - static,
R - RIP, M - mobile, B - BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area N1 -
OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF
external type 2, V - VPN i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route o - ODR, P - periodic
downloaded static route, + - replicated route Gateway of last resort is 192.0.2.100 to network
0.0.0.0 B 172.16.1.0 255.255.255.0 [200/0] via 209.165.201.1, 00:00:57 B 172.16.2.0
255.255.255.0 [200/0] via 172.16.1.100, 09:01:23

```

FTD2

```

!--- Check the IKEv2 sa with remote peer ---! ftd2# show crypto ikev2 sa IKEv2 SAs: Session-
id:34, Status:UP-ACTIVE, IKE count:1, CHILD count:1 Tunnel-id Local Remote Status Role 862624945
209.165.201.1/500 192.0.2.1/500 READY RESPONDER Encr: DES, Hash: SHA96, DH Grp:5, Auth sign:
PSK, Auth verify: PSK Life/Active Time: 86400/32429 sec Child sa: local selector 209.165.201.1/0
- 209.165.201.1/65535 remote selector 192.0.2.1/0 - 192.0.2.1/65535 ESP spi in/out:
0x4b6beb6c/0xd8ba0545 !--- Check the IPsec sa with remote peer and check the number of encrypts
and decrypts---! ftd2# show crypto ipsec sa interface: outside Crypto map tag: CSM_outside_map,
seq num: 2, local addr: 209.165.201.1 access-list CSM_IPSEC_ACL_2 extended permit ip host
209.165.201.1 host 192.0.2.1 local ident (addr/mask/prot/port):
(209.165.201.1/255.255.255.255/0/0) remote ident (addr/mask/prot/port):
(192.0.2.1/255.255.255.255/0/0) current_peer: 192.0.2.1 #pkts encaps: 1107, #pkts encrypt: 1107,
#pkts digest: 1107 #pkts decaps: 1106, #pkts decrypt: 1106, #pkts verify: 1106 #pkts compressed:
0, #pkts decompressed: 0 #pkts not compressed: 1107, #pkts comp failed: 0, #pkts decomp failed:
0 #pre-frag successes: 0, #pre-frag failures: 0, #fragments created: 0 #PMTUs sent: 0, #PMTUs
rcvd: 0, #decapsulated frgs needing reassembly: 0 #TFC rcvd: 0, #TFC sent: 0 #Valid ICMP Errors
rcvd: 0, #Invalid ICMP Errors rcvd: 0 #send errors: 0, #recv errors: 0 local crypto endpt.:
209.165.201.1/500, remote crypto endpt.: 192.0.2.1/500 path mtu 1500, ipsec overhead 58(36),
media mtu 1500 PMTU time remaining (sec): 0, DF policy: copy-df ICMP error validation: disabled,
TFC packets: disabled current outbound spi: D8BA0545 current inbound spi : 4B6BEB6C inbound esp
sas: spi: 0x4B6BEB6C (1265363820) SA State: active transform: esp-des esp-sha-hmac no
compression in use settings ={L2L, Tunnel, IKEv2, } slot: 0, conn_id: 1516, crypto-map:
CSM_outside_map sa timing: remaining key lifetime (kB/sec): (4008945/21713) IV size: 8 bytes
replay detection support: Y Anti replay bitmap: 0xFFFFFFFF 0xFFFFFFFF outbound esp sas: spi:
0xD8BA0545 (3636069701) SA State: active transform: esp-des esp-sha-hmac no compression in use
settings ={L2L, Tunnel, IKEv2, } slot: 0, conn_id: 1516, crypto-map: CSM_outside_map sa timing:
remaining key lifetime (kB/sec): (4239345/21713) IV size: 8 bytes replay detection support: Y

```

```
Anti replay bitmap: 0x00000000 0x00000001 !--- Check the BGP router summary ---! ftd2# show bgp
summary BGP router identifier 10.127.248.36, local AS number 100 BGP table version is 44, main
routing table version 44 3 network entries using 600 bytes of memory 3 path entries using 240
bytes of memory 2/2 BGP path/bestpath attribute entries using 416 bytes of memory 0 BGP route-
map cache entries using 0 bytes of memory 0 BGP filter-list cache entries using 0 bytes of
memory BGP using 1256 total bytes of memory BGP activity 20/17 prefixes, 26/23 paths, scan
interval 60 secs Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd 192.0.2.1 4
100 486 492 44 0 0 08:59:40 2 !--- Check the BGP neighborship ---! ftd2# show bgp neighbors BGP
neighbor is 192.0.2.1, context single_vf, remote AS 100, internal link BGP version 4, remote
router ID 10.127.248.35 BGP state = Established, up for 08:59:42 Last read 00:00:53, last write
00:00:38, hold time is 180, keepalive interval is 60 seconds Neighbor sessions: 1 active, is not
multisession capable (disabled) Neighbor capabilities: Route refresh: advertised and
received(new) Four-octets ASN Capability: advertised and received Address family IPv4 Unicast:
advertised and received Multisession Capability: Message statistics: InQ depth is 0 OutQ depth
is 0 Sent Rcvd Opens: 1 1 Notifications: 0 0 Updates: 2 3 Keepalives: 489 482 Route Refresh: 0 0
Total: 492 486 Default minimum time between advertisement runs is 0 seconds For address family:
IPv4 Unicast Session: 192.0.2.1 BGP table version 44, neighbor version 44/0 Output queue size :
0 Index 19 19 update-group member Sent Rcvd Prefix activity: ---- ---- Prefixes Current: 1 2
(Consumes 160 bytes) Prefixes Total: 1 2 Implicit Withdraw: 0 0 Explicit Withdraw: 0 0 Used as
bestpath: n/a 2 Used as multipath: n/a 0 Outbound Inbound Local Policy Denied Prefixes: -----
----- Bestpath from this peer: 2 n/a Invalid Path: 2 n/a Total: 4 0 Number of NLRI in the
update sent: max 1, min 0 Address tracking is enabled, the RIB does have a route to 192.0.2.1
Connections established 2; dropped 1 Last reset 08:59:57, due to Peer closed the session of
session 1 Transport(tcp) path-mtu-discovery is disabled Graceful-Restart is disabled !--- Check
the routes learned from BGP ---! ftd2# show route bgp Codes: L - local, C - connected, S -
static, R - RIP, M - mobile, B - BGP D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter
area N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1,
E2 - OSPF external type 2, V - VPN i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS
level-2 ia - IS-IS inter area, * - candidate default, U - per-user static route o - ODR, P -
periodic downloaded static route, + - replicated route Gateway of last resort is 209.165.201.100
to network 0.0.0.0 B 10.1.1.0 255.255.255.0 [200/0] via 192.0.2.1, 08:59:46 B 10.1.2.0
255.255.255.0 [200/0] via 10.1.1.100, 08:59:46
```

Dépannage

Il n'existe actuellement aucune information de dépannage spécifique pour cette configuration.