

Annonce des sous-réseaux VPN d'accès distant via les protocoles de routage dans FTD

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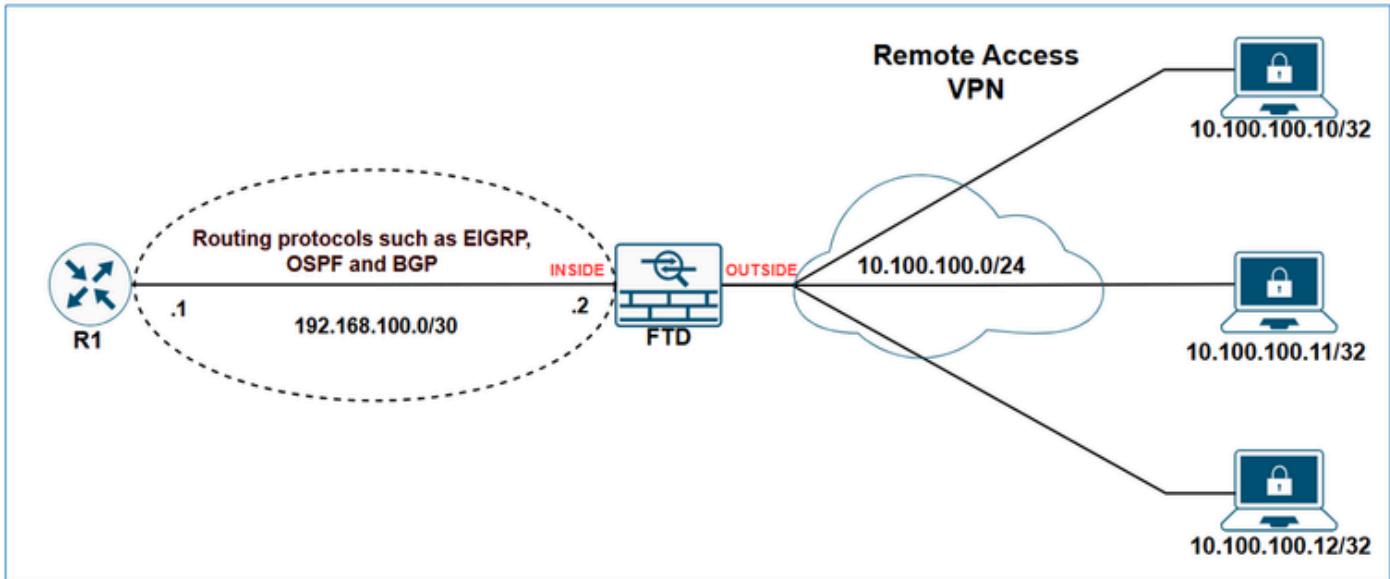
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Introduction

Ce document décrit les options disponibles pour annoncer les sous-réseaux associés au VPN à l'aide des protocoles de routage EIGRP, OSPF et BGP.



Conditions préalables

Exigences

Aucune exigence spécifique n'est associée à ce document.

Composants utilisés

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. Si votre réseau est en ligne, assurez-vous de bien comprendre l'incidence possible des commandes.

Les informations contenues dans ce document sont basées sur les versions de matériel et de logiciel suivantes :

- Cisco Secure Firewall Management Center 7.6.0
- Cisco Secure Firewall 7.6.0

Remarque : Ce document décrit la configuration pour la redistribution des sous-réseaux VPN d'accès à distance via EIGRP, OSPF et BGP à l'aide du FMC. Pour obtenir des conseils sur la redistribution de route avec FDM, reportez-vous au [guide de](#) configuration FDM.

Informations générales

La première chose à comprendre est comment le FTD classe les sous-réseaux VPN dans sa table de routage. Bien que ces sous-réseaux apparaissent comme connectés par VPN, ils ne sont pas considérés comme des sous-réseaux connectés directement ; au lieu de cela, ils sont traités comme des routes statiques.

Les résultats de la commande show le démontrent.

Sortie FTD show route :

```
<#root>
```

```
FTD-1#
```

```
show route
```

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
SI - Static InterVRF, BI - BGP InterVRF

Gateway of last resort is not set

```
C      10.10.20.0 255.255.255.0 is directly connected, outside
L      10.10.20.1 255.255.255.255 is directly connected, outside
C      192.168.100.0 255.255.255.252 is directly connected, inside
L      192.168.100.2 255.255.255.255 is directly connected, inside
v      10.100.100.10 255.255.255.255 connected by VPN (advertised), outside
```

Sortie FTD show route connected :

```
<#root>
```

```
FTD-1#
```

```
show route connected
```

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
SI - Static InterVRF, BI - BGP InterVRF

Gateway of last resort is not set

```
C      10.10.20.0 255.255.255.0 is directly connected, outside
L      10.10.20.1 255.255.255.255 is directly connected, outside
C      192.168.100.0 255.255.255.252 is directly connected, inside
L      192.168.100.2 255.255.255.255 is directly connected, inside
```

Sortie FTD show route static :

```
<#root>
```

```
FTD-HQ-1#
```

```
show route static
```

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
SI - Static InterVRF, BI - BGP InterVRF

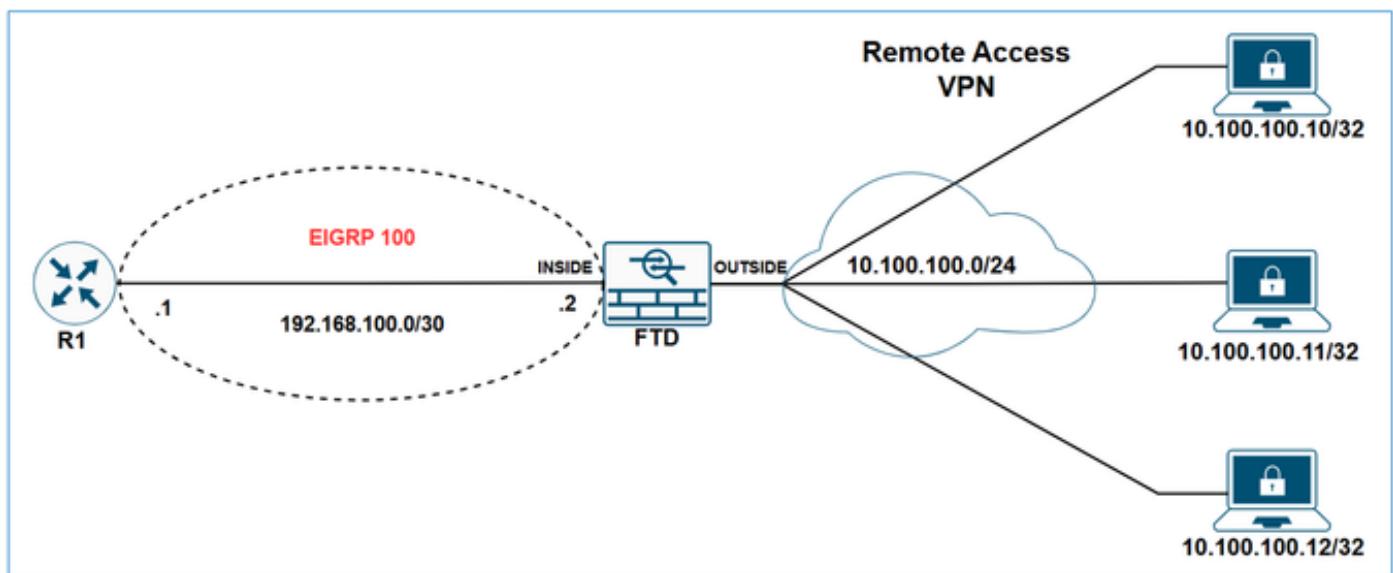
Gateway of last resort is not set

```
v      10.100.100.10 255.255.255.255 connected by VPN (advertised), outside
```

Maintenant que la manière dont les sous-réseaux VPN sont traités dans la table de routage du pare-feu est claire, l'étape suivante consiste à explorer comment les annoncer à l'aide de divers protocoles de routage.

Redistribution des sous-réseaux VPN d'accès à distance via EIGRP sur FTD

Diagramme du réseau



Les routes statiques qui entrent dans le cadre d'une instruction réseau sont automatiquement redistribuées au protocole EIGRP ; vous n'avez pas besoin de définir une règle de redistribution pour eux. Cependant, lors de la redistribution de routes statiques qui pointent vers des interfaces VTI dans EIGRP, vous devez spécifier la métrique. Pour les routes statiques pointant vers d'autres types d'interfaces, il n'est pas nécessaire de spécifier la métrique.

En raison du comportement du protocole EIGRP consistant à redistribuer automatiquement les routes statiques qui entrent dans le cadre des instructions réseau, il existe deux options pour annoncer les sous-réseaux VPN via le protocole EIGRP sur FTD :

1. Utilisation d'une instruction network.
2. Utilisation de l'approche statique redistribute.

Dans cet exemple, l'objectif est de faire apprendre à R1 le sous-réseau VPN 10.100.100.0/24 via EIGRP.

Configuration initiale FTD :

```
<#root>

hostname FTD-1
!
ip local pool VPN-POOL1 10.100.100.10-10.100.100.254 mask 255.255.255.0

!
webvpn
...
  group-policy LAB_GROUP1 internal
group-policy LAB_GROUP1 attributes
...
  address-pools value VPN-POOL1
!
router eigrp 100

no default-information in
no default-information out
no eigrp log-neighbor-warnings
no eigrp log-neighbor-changes

network 192.168.100.0 255.255.255.252
```

FTD Table de routage initiale :

```
<#root>
```

```
FTD-1#
```

```
show route
```

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

SI - Static InterVRF, BI - BGP InterVRF

Gateway of last resort is not set

```
C      10.10.20.0 255.255.255.0 is directly connected, outside
L      10.10.20.1 255.255.255.255 is directly connected, outside
C      192.168.100.0 255.255.255.252 is directly connected, inside
L      192.168.100.2 255.255.255.255 is directly connected, inside
v      10.100.100.10 255.255.255.255 connected by VPN (advertised), outside
```

Table topologique EIGRP initiale FTD :

```
<#root>
FTD-1#
show eigrp topology
```

```
EIGRP-IPv4 Topology Table for AS(100)/ID(192.168.100.2)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status
```

```
P 192.168.100.0 255.255.255.252, 1 successors, FD is 512 via Connected, inside
```

Table de routage initial de R1 :

```
<#root>
R1#
show ip route
```

```
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, m - OMP
       n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
       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
       H - NHRP, G - NHRP registered, g - NHRP registration summary
       o - ODR, P - periodic downloaded static route, l - LISP
       a - application route
       + - replicated route, % - next hop override, p - overrides from PfR
       & - replicated local route overrides by connected
```

Gateway of last resort is not set

```
C      192.168.100.0/30 is directly connected, GigabitEthernet1
L      192.168.100.1/32 is directly connected, GigabitEthernet1
```

Redistribution des sous-réseaux VPN d'accès distant via EIGRP sur FTD à l'aide de l'instruction network

Configurer

Étape 1 : création d'un objet réseau pour le sous-réseau VPN

Edit Network Object

[?](#)

Name
VPN-SUBNET

Description

Network

Host Range Network FQDN

Allow Overrides

[Cancel](#) [Save](#)

Étape 2 : inclusion de l'objet de sous-réseau VPN dans l'instruction network

Dans l'interface utilisateur de gestion des périphériques FMC, accédez à Routing > EIGRP > Setup, et incluez le sous-réseau VPN dans les réseaux/hôtes sélectionnés.

The screenshot shows the Firewall Management Center interface for FTD-1. The top navigation bar includes tabs for Overview, Analysis, Policies, Devices (selected), Objects, and Integration. Below the navigation is a summary section for Cisco Secure Firewall Threat Defense for VMware, FTD-1.

The main content area is titled "Manage Virtual Routers" and shows the "Global" configuration. On the left sidebar, under the "Virtual Router Properties" section, "EIGRP" is selected (Step 2). The "AS Number" field is set to 100 (Step 3). The "Selected Networks/Hosts" list contains "HQ-WAN-1" and "VPN-SUBNET" (Step 4).

Enregistrez et déployez la configuration sur le FTD.

Vérifier

Configuration EIGRP FTD :

```
<#root>
FTD-1#
show run router

router eigrp 100
 no default-information in
 no default-information out
 no eigrp log-neighbor-warnings
 no eigrp log-neighbor-changes

network 10.100.100.0 255.255.255.0

network 192.168.100.0 255.255.255.252
```

Table topologique EIGRP FTD :

```
<#root>
```

```
FTD-1#
```

```
show eigrp topology
```

```
EIGRP-IPv4 Topology Table for AS(100)/ID(192.168.100.2)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - reply Status, s - sia Status
```

```
P 10.100.100.10 255.255.255.255, 1 successors, FD is 512
```

```
via Rstatic (512/0)
```

```
P 192.168.100.0 255.255.255.252, 1 successors, FD is 512
    via Connected, inside
```

Table de routage R1:

```
<#root>
```

```
R1#
```

```
show ip route
```

```
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, m - OMP
      n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
      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
      H - NHRP, G - NHRP registered, g - NHRP registration summary
      o - ODR, P - periodic downloaded static route, l - LISP
      a - application route
      + - replicated route, % - next hop override, p - overrides from PfR
      & - replicated local route overrides by connected
```

```
Gateway of last resort is not set
```

```
C      192.168.100.0/30 is directly connected, GigabitEthernet1
L      192.168.100.1/32 is directly connected, GigabitEthernet1
      10.0.0.0/32 is subnetted, 1 subnets
D      10.100.100.10
```

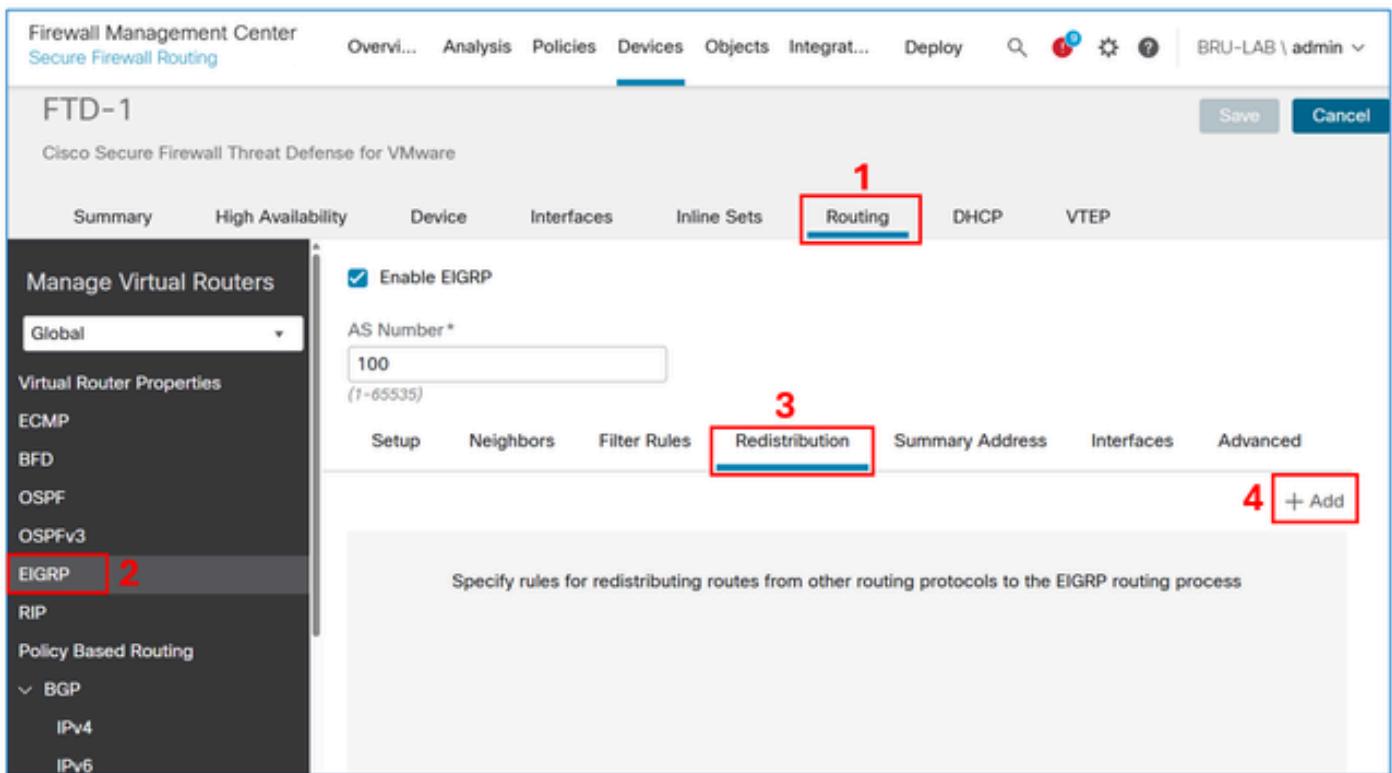
```
[90/3072] via 192.168.100.2, 00:02:17, GigabitEthernet1
```

 Remarque : Notez que bien que l'instruction network ait été 10.100.100.0/24, le FTD redistribue un sous-réseau /32 sur EIGRP. Cela se produit parce que le FTD crée une route statique avec un préfixe /32 pour chaque session VPN d'accès à distance. Pour optimiser cela, vous pouvez utiliser la fonctionnalité d'adresse récapitulative EIGRP.

Redistribuez les sous-réseaux VPN d'accès à distance via EIGRP sur FTD en utilisant l'approche statique redistribute

Configurer

Dans l'interface utilisateur de gestion des périphériques FMC, accédez à Routing > EIGRP > Redistribution, puis sélectionnez le bouton Add.



The screenshot shows the FMC interface for configuring EIGRP redistribution. The top navigation bar includes Firewall Management Center, Secure Firewall Routing, Overview, Analysis, Policies, Devices, Objects, Integrat..., Deploy, and user BRU-LAB \ admin. The main title is FTD-1, Cisco Secure Firewall Threat Defense for VMware. The left sidebar lists Manage Virtual Routers, Global, Virtual Router Properties, ECMP, BFD, OSPF, OSPFv3, EIGRP (selected), RIP, Policy Based Routing, BGP (IPv4, IPv6). The main content area has tabs: Summary, High Availability, Device, Interfaces, Inline Sets, **Routing** (selected), DHCP, VTEP. Under Routing, 'Enable EIGRP' is checked, AS Number is set to 100. Below is a tab bar with Setup, Neighbors, Filter Rules, **Redistribution** (selected), Summary Address, Interfaces, Advanced. A red box highlights the 'Redistribution' tab. At the bottom right is a red box around the '+ Add' button. A red number '1' is above the 'Routing' tab, '2' is above 'EIGRP' in the sidebar, '3' is above the 'Redistribution' tab, and '4' is above the '+ Add' button.

Dans le champ de protocole, sélectionnez Static, puis cliquez sur le bouton OK.

Add Redistribution



Protocol

Protocol *

Optional OSPF Redistribution

 Internal External1 External2 Nssa-External1 Nssa-External2

Optional Metrics

Bandwidth

(1-4294967295 in kbps)

Delay Time

(0-4294967295 in 10⁻⁶s)

Reliability

(0-255)

Loading

(1-255)

MTU

(1-65535 in bytes)

Route Map



Cancel

OK

Attention : toutes les routes statiques sont redistribuées dans EIGRP. Si vous devez annoncer uniquement les sous-réseaux VPN, vous pouvez soit utiliser l'approche d'instruction réseau, soit appliquer une carte de routage pour les filtrer.

Le résultat :

The screenshot shows the FTD configuration interface for EIGRP. At the top, there is a checkbox for 'Enable EIGRP'. Below it, the 'AS Number' is set to 100. The 'Redistribution' tab is currently selected, indicated by a red border around the tab name. Under the redistribution section, there is a table with columns: Protocol, ID, Bandwidth, Delay Time, Reliability, Loading, MTU, and Route Map. A single row is present in the table, labeled 'STATIC'. A red box highlights both the 'Redistribution' tab and the entire row for 'STATIC'.

Enregistrez et déployez la configuration sur le FTD.

Vérifier

Configuration EIGRP FTD :

```
<#root>
FTD-HQ-1#
show run router

router eigrp 100
no default-information in
no default-information out
no eigrp log-neighbor-warnings
no eigrp log-neighbor-changes
network 192.168.100.0 255.255.255.252

redistribute static
```

Table topologique EIGRP FTD :

```
<#root>
FTD-1#
show eigrp topology

EIGRP-IPv4 Topology Table for AS(100)/ID(192.168.100.2)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
      r - reply Status, s - sia Status

P 10.100.100.10 255.255.255.255, 1 successors, FD is 512
      via Rstatic (512/0)

P 192.168.100.0 255.255.255.252, 1 successors, FD is 512
      via Connected, inside
```

Table de routage R1:

```
<#root>
```

```
R1#
```

```
show ip route
```

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, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
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
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is not set

```
C      192.168.100.0/30 is directly connected, GigabitEthernet1
L      192.168.100.1/32 is directly connected, GigabitEthernet1
D EX    10.100.100.10
```

```
[170/3072] via 192.168.100.2, 00:03:52, GigabitEthernet1
```

 Conseil : Vous pouvez éventuellement utiliser la fonctionnalité d'adresse récapitulative EIGRP sur FTD pour optimiser la taille de la table de routage.

Configuration des adresses récapitulatives EIGRP

Configurer

S'il n'a pas encore été créé, créez un objet réseau pour les sous-réseaux VPN.

Edit Network Object



Name

Description

Network

Host Range Network FQDN

Allow Overrides

[Cancel](#)

[Save](#)

Dans l'interface utilisateur de gestion des périphériques FMC, accédez à Routing > EIGRP > Summary Address, puis sélectionnez le bouton Add.

The screenshot shows the 'Devices' tab selected in the top navigation bar of the Firewall Management Center. Under the 'Devices / Secure Firewall Routing' section, the device 'FTD-1' is selected. The 'Cisco Secure Firewall Threat Defense for VMware' tab is active. On the left, a sidebar lists routing protocols: ICMP, BFD, OSPF, OSPFv3, **EIGRP**, RIP, Policy Based Routing (BGP, IPv4, IPv6). The 'EIGRP' option is highlighted with a red box. The main panel shows the 'Routing' tab selected (also highlighted with a red box). A sub-tab 'Summary Address' is also highlighted with a red box. An 'AS Number' input field contains '100'. A 'Summary Address' table has a '+ Add' button highlighted with a red box. The status bar at the bottom right shows 'BRU-LAB | admin' and 'SECURE'.

Dans le champ interface, saisissez celui qui fait face au voisin EIGRP, et dans le champ network, saisissez l'objet créé pour le sous-réseau VPN.

Add Summary Address



Interface *

inside



Network *

VPN-SUBNET



Administrative Distance

(1-255)

Cancel

OK

Le résultat :

Enable EIGRP

AS Number*

100
(1-65535)

Setup Neighbors Filter Rules Redistribution Summary Address Interfaces Advanced

+ Add

Interface	Network	Administrative Distance
inside	VPN-SUBNET	

Vérifier

Configuration de l'adresse récapitulative EIGRP FTD :

```
<#root>

FTD-1#
sh run interface

interface GigabitEthernet0/0
 nameif inside
 security-level 0
 zone-member inside
 ip address 192.168.100.2 255.255.255.252
summary-address eigrp 100 10.100.100.0 255.255.255.0
```

Table topologique EIGRP FTD :

```
<#root>

FTD-1#
show eigrp topology

EIGRP-IPv4 Topology Table for AS(100)/ID(192.168.100.2)
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
      r - reply Status, s - sia Status
```

```
P 10.100.100.10 255.255.255.255, 1 successors, FD is 512
    via Rstatic (512/0)

P 10.100.100.0 255.255.255.0, 1 successors, FD is 512
```

```

via Summary (512/0), Null0

P 192.168.100.0 255.255.255.0, 1 successors, FD is 512
  via Connected, inside

```

Table de routage R1:

```
<#root>
```

```
R1#
```

```
show ip route
```

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, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
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
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is not set

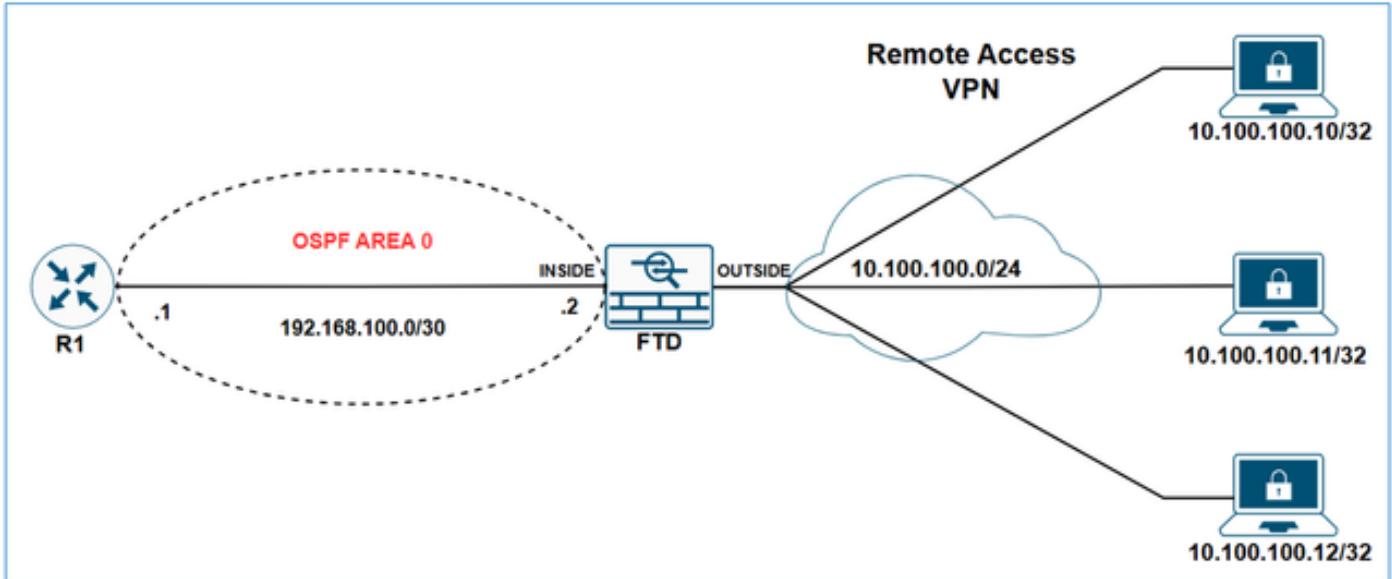
```

C      192.168.100.0/30 is directly connected, GigabitEthernet1
L      192.168.100.1/32 is directly connected, GigabitEthernet1
      10.0.0.0/24 is subnetted, 1 subnets
D          10.100.100.0 [90/3072] via 192.168.100.2, 00:01:54, GigabitEthernet1

```

Redistribution des sous-réseaux VPN d'accès à distance via OSPF sur FTD

Diagramme du réseau



Paramètres de configuration initiaux

```
<#root>

ip local pool VPN-POOL1 10.100.100.10-10.100.100.254 mask 255.255.255.0

!
webvpn
  group-policy LAB_GROUP1 internal
  ...
group-policy LAB_GROUP1 attributes
  ...

address-pools value VPN-POOL1

!
router ospf 1

network 192.168.100.0 255.255.255.252 area 0
```

Sortie de la commande FTD show ospf neighbor :

```
<#root>

FTD-1#
show ospf neighbor

Neighbor ID      Pri   State          Dead Time     Address           Interface
192.168.100.1        1   FULL/DR      0:00:39    192.168.100.1   inside
```

Résultat de la commande show ip ospf neighbor de R1 :

```
<#root>

R1#
show ip ospf neighbor

Neighbor ID      Pri   State            Dead Time     Address          Interface
192.168.100.2    1     FULL/BDR        00:00:37     192.168.100.2  GigabitEthernet1
```

Table de routage R1:

```
<#root>

R1#
show ip route

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, m - OMP
      n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
      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
      H - NHRP, G - NHRP registered, g - NHRP registration summary
      o - ODR, P - periodic downloaded static route, l - LISP
      a - application route
      + - replicated route, % - next hop override, p - overrides from PfR
      & - replicated local route overrides by connected

Gateway of last resort is not set

C       192.168.100.0/30 is directly connected, GigabitEthernet1
L       192.168.100.1/32 is directly connected, GigabitEthernet1
```

Configurer

Dans l'interface utilisateur de gestion des périphériques FMC, accédez à Routing > OSPF > Redistribution, puis sélectionnez le bouton Add.

Firewall Management Center
Secure Firewall Routing

Over... Ana... Poli... Dev... Obj... Integ... Deploy BRU-LAB \ admin

FTD-1

Cisco Secure Firewall Threat Defense for VMware

Summary High Availability Device Interfaces Inline Sets **Routing** DHCP VTEP

Manage Virtual Routers

Global

Virtual Router Properties

ECMP

BFD

OSPF

OSPFv3

EIGRP

RIP

Policy Based Routing

 BGP

 IPv4

 IPv6

Process 1 ID: 1

OSPF Role: **ASBR** Enter Description here Advanced

Process 2 ID:

OSPF Role: Internal Router Enter Description here Advanced

Area **Redistribution** InterArea Filter Rule Summary Address Interface **+ Add**

No records to display

The screenshot shows the Cisco Secure Firewall Threat Defense (FTD) interface. The top navigation bar includes tabs for Summary, High Availability, Device, Interfaces, Inline Sets, Routing (which is highlighted with a red box), DHCP, and VTEP. Below the navigation is a sidebar titled "Manage Virtual Routers" with options like Global, ECMP, BFD, OSPF (which is selected and highlighted with a red box), OSPFv3, EIGRP, RIP, Policy Based Routing, BGP, IPv4, and IPv6. The main content area shows OSPF configuration for Process 1, including OSPF Role (ASBR), ID (1), and a note to enter a description. It also shows Process 2 with a placeholder ID and OSPF Role (Internal Router). Under the Area tab, the "Redistribution" sub-tab is selected (highlighted with a red box). A "No records to display" message is shown below the table headers: OSPF P..., Route T..., Match, Subnets, Metric ... (x2), Tag Value, Route ... (x2).

Remarque : Le rôle OSPF doit être défini sur ASBR ou ABR & ASBR pour activer la redistribution.

Dans le champ Type de route, sélectionnez Static, puis cochez la case Use Subnets.

Add Redistribution



OSPF Process*: 1

Route Type: **Static**

Optional

- Internal
- External1
- External2
- NSSA External1
- NSSA External2
- Use Subnets

Metric Value:

Metric Type: 2

Tag Value:

RouteMap:



Cancel

OK

⚠️ Attention : toutes les routes statiques sont redistribuées dans OSPF. Si vous devez annoncer uniquement les sous-réseaux VPN, vous pouvez appliquer une carte de routage pour les filtrer.

Le résultat :

The screenshot shows a configuration interface for OSPF redistribution. At the top, there are two sections for OSPF Process 1 and OSPF Process 2. Process 1 is set to ASBR role with ID 1, and Process 2 is set to Internal Router role with ID 2. Both have an 'Advanced' button. Below this is a table titled 'Redistribution' with columns: OSPF Process, Route Type, Match, Subnets, Metric Value, Metric Type, Tag Value, and Route Map. A single row is present for Process 1, which redistributes static routes (Route Type: static) with a metric of 2. The 'Match' column is set to 'false' and the 'Subnets' column is set to 'true'. There is also a '+' Add button at the top right of the table.

OSPF Process	Route Type	Match	Subnets	Metric Value	Metric Type	Tag Value	Route Map
1	static	false	true	2			

Vérifier

Configuration de redistribution OSPF FTD :

```
<#root>
FTD-1#
sh run router

router ospf 1
network 192.168.100.0 255.255.255.252 area 0
redistribute static subnets
```

Table de routage R1:

```
<#root>
```

```
R1#
show ip route
```

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, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
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
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is not set

```
C      192.168.100.0/30 is directly connected, GigabitEthernet1
L      192.168.100.1/32 is directly connected, GigabitEthernet1
      10.0.0.0/32 is subnetted, 1 subnets
o E2      10.100.100.10 [110/20] via 192.168.100.2, 00:08:01, GigabitEthernet1
```

 Conseil : Notez que bien que le pool VPN soit 10.100.100.0/24, le FTD redistribue un sous-réseau /32 sur OSPF. Cela se produit parce que le FTD crée une route statique avec un préfixe /32 pour chaque session VPN d'accès à distance. Pour optimiser cela, vous pouvez utiliser la fonctionnalité OSPF Summary Address.

Configuration des adresses récapitulatives OSPF

Configurer

S'il n'a pas encore été créé, créez un objet réseau pour les sous-réseaux VPN.

Edit Network Object



Name

Description

Network

Host Range Network FQDN

Allow Overrides

[Cancel](#)

[Save](#)

Dans l'interface utilisateur de gestion des périphériques FMC, accédez à Routing > OSPF> Summary Address, puis sélectionnez le bouton Add.

Firewall Management Center Secure Firewall Routing Over... Ana... Poli... Dev... Obj... Integ... Deploy 🔍 ⚙️ ⓘ BRU-LAB \ admin

FTD-1

Cisco Secure Firewall Threat Defense for VMware

Save Cancel

Summary High Availability Device Interfaces Inline Sets **Routing** (1) DHCP VTEP

Manage Virtual Routers

Global (2)

Virtual Router Properties

ECMP

BFD

OSPF (2)

OSPFv3

EIGRP

RIP

Policy Based Routing

 BGP

 IPv4

 IPv6

Area Redistribution InterArea Filter Rule **Summary Address** (3) Interface

+ Add (4)

OSPF Process	Networks	Tag	Advertise
No records to display			

The screenshot shows the 'Routing' tab selected in the top navigation bar. A red box labeled '1' highlights the 'Routing' tab. On the left, a sidebar lists various routing protocols: Global, OSPF (selected), OSPFv3, EIGRP, RIP, Policy Based Routing, and BGP (with sub-options for IPv4 and IPv6). A red box labeled '2' highlights the 'OSPF' entry in the sidebar. The main configuration area shows two OSPF processes: Process 1 (ASBR role, ID 1) and Process 2 (Internal Router role, ID empty). A red box labeled '3' highlights the 'Summary Address' tab under the OSPF configuration. A red box labeled '4' highlights the '+ Add' button for adding new summary addresses.

Ajoutez l'objet de sous-réseau VPN et cochez la case Annoncer.

Edit Summary Address



OSPF Process:

1

Available Network + C

Q VPN X

VPN-SUBNET 1

2

Add

Selected Network

VPN-SUBNET



Tag:

Advertise (allow routes that match specified address/mask pair)

3

4

Cancel

OK

Le résultat :

Process 1
ID: 1

OSPF Role:

ASBR

Enter Description here

Advanced

Process 2

ID:

Advanced

OSPF Role:

Internal Router

Enter Description here

Advanced

Area
Redistribution
InterArea
Filter Rule
Summary Address
Interface

+ Add

OSPF Process	Networks	Tag	Advertise	
1	VPN-SUBNET	true	✎ ✖	

Vérifier

Configuration FTD OSPF :

```
<#root>
FTD-1#
sh run router

router ospf 1
network 192.168.100.0 255.255.255.252 area 0
redistribute static subnets

summary-address 10.100.100.0 255.255.255.0
```

Table de routage R1:

```
<#root>
R1#
sh ip route
```

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, m - OMP
 n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
 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
 H - NHRP, G - NHRP registered, g - NHRP registration summary
 o - ODR, P - periodic downloaded static route, l - LISP
 a - application route
 + - replicated route, % - next hop override, p - overrides from PfR
 & - replicated local route overrides by connected

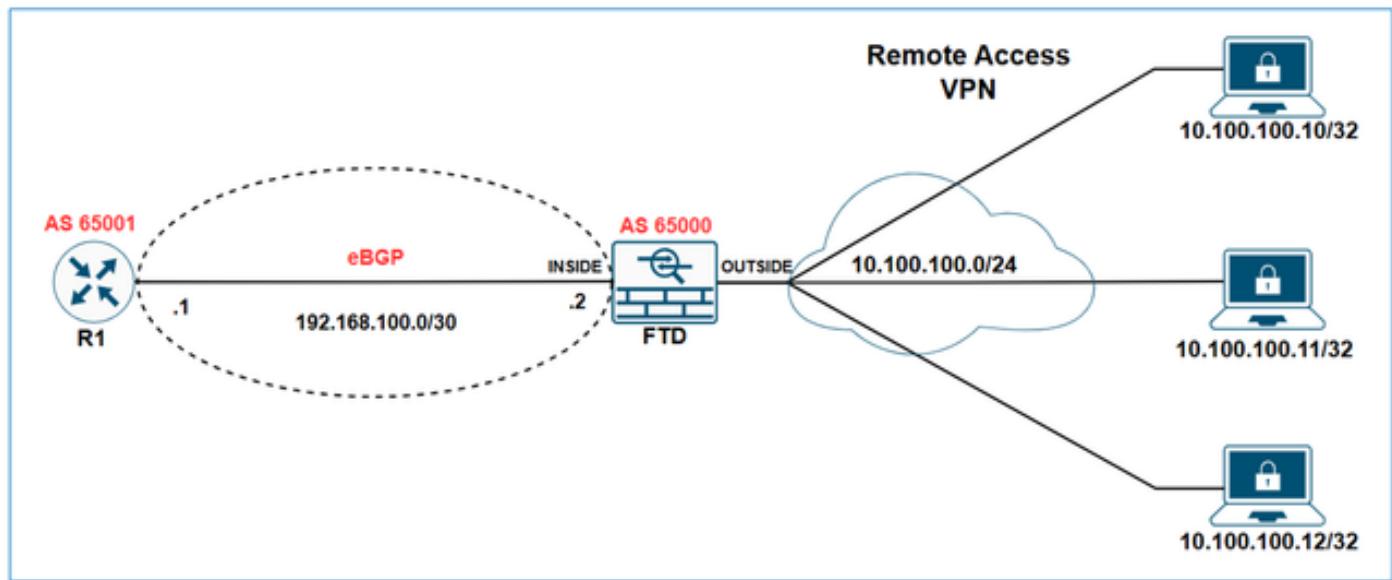
Gateway of last resort is not set

```

C      192.168.100.0/30 is directly connected, GigabitEthernet1
L      192.168.100.1/32 is directly connected, GigabitEthernet1
      10.0.0.0/24 is subnetted, 1 subnets
o  E2    10.100.100.0 [110/20] via 192.168.100.2, 00:00:26, GigabitEthernet1
  
```

Redistribuer les sous-réseaux VPN d'accès à distance via eBGP sur FTD

Diagramme du réseau



Dans cet exemple, l'objectif est de faire apprendre à R1 le sous-réseau VPN 10.100.100.0/24 via eBGP.

Paramètres de configuration initiaux

FTD Configuration initiale :

```

<#root>

hostname FTD-1
!
ip local pool VPN-POOL1 10.100.100.10-10.100.100.254 mask 255.255.255.0
  
```

```
!
webvpn
...
  group-policy LAB_GROUP1 internal
group-policy LAB_GROUP1 attributes
...
address-pools value VPN-POOL1

!
router bgp 65000
  bgp log-neighbor-changes
  bgp router-id vrf auto-assign
  address-family ipv4 unicast
    neighbor 192.168.100.1 remote-as 65001
    neighbor 192.168.100.1 transport path-mtu-discovery disable
    neighbor 192.168.100.1 activate
    no auto-summary
    no synchronization
  exit-address-family
```

Sortie de la table FTD bgp :

```
<#root>
FTD-1#
show bgp

BGP table version is 25, local router ID is 192.168.100.2
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath
Origin codes: i - IGP, e - EGP, ? - incomplete

Network          Next Hop          Metric LocPrf Weight Path
r> 192.168.100.0/30  192.168.100.1        1          0  65001 ?
```

FTD show bgp summary sortie :

```
<#root>
FTD-1#
show bgp summary

BGP router identifier 192.168.100.2, local AS number 65000
BGP table version is 25, main routing table version 25
1 network entries using 2000 bytes of memory
17 path entries using 1360 bytes of memory
```

```

3/3 BGP path/bestpath attribute entries using 624 bytes of memory
2 BGP AS-PATH entries using 48 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 4032 total bytes of memory
BGP activity 176/166 prefixes, 257/240 paths, scan interval 60 secs

```

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
192.168.100.1	4	65001	4589	3769	25	0	0	2d21h	8

Sortie show ip bgp summary de R1 :

```

<#root>

R1#
sh ip bgp summary

BGP router identifier 192.168.100.1, local AS number 65001
BGP table version is 258, main routing table version 258
1 network entries using 2480 bytes of memory
1 path entries using 2312 bytes of memory
1/1 BGP path/bestpath attribute entries using 864 bytes of memory
1 BGP AS-PATH entries using 64 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 5720 total bytes of memory
BGP activity 85/75 prefixes, 244/227 paths, scan interval 60 secs
12 networks peaked at 11:10:00 Apr 17 2025 UTC (00:06:27.485 ago)

Neighbor      V      AS MsgRcvd MsgSent   TblVer InQ OutQ Up/Down State/PfxRcd
192.168.100.2 4      65000    3770     4590      258     0     0 2d21h          9

```

Sortie de la table bgp de R1 :

```

<#root>

R1#
show ip bgp

BGP table version is 258, local router ID is 192.168.100.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found
Network          Next Hop          Metric LocPrf Weight Path
*> 192.168.100.0/30           0.0.0.0      1       32768 ?

```

Table de routage R1:

```
<#root>
```

```
R1#
```

```
show ip route
```

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, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
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
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from Pfr
& - replicated local route overrides by connected

Gateway of last resort is not set

```
C      192.168.100.0/30 is directly connected, GigabitEthernet1
L      192.168.100.1/32 is directly connected, GigabitEthernet1
```

Configurer

Dans l'interface utilisateur de gestion des périphériques FMC, accédez à Routing > BGP > IPv4 > Redistribution, puis sélectionnez le bouton Add.

The screenshot shows the FTD-1 configuration interface. On the left, there's a sidebar with a tree view of routing protocols: Global, Virtual Router Properties, ECMP, BFD, OSPF, OSPFv3, EIGRP, RIP, Policy Based Routing (with BGP expanded), and IPv4 (which is selected and highlighted with a red box). The main panel has tabs for Summary, High Availability, Device, Interfaces, Inline Sets, Routing (selected and highlighted with a red box), DHCP, and VTEP. Under Routing, it shows 'Enable IPv4: AS Number 65000'. Below that are tabs for General, Neighbor, Add Aggregate Address, Filtering, Networks (selected and highlighted with a red box), and Redistribution (selected and highlighted with a red box). A large table below these tabs is titled '+ Add' and has columns for Source Protocol, AS Number/Process ID, Metric, RouteMap, and Match. A message at the bottom of the table says 'No records to display'.

Dans le champ Source Protocol, choisissez Static, puis sélectionnez le bouton OK.

Add Redistribution



Source Protocol

Static

Process ID*

Metric

(0-4294967295)

Route Map

 +

Match

- Internal
- External 1
- External 2
- NSSAExternal 1
- NSSAExternal 2

⚠ : cela redistribue toutes les routes statiques dans BGP. Si vous devez annoncer uniquement les sous-réseaux VPN, vous pouvez appliquer une carte de routage pour les filtrer.

Le résultat :

The screenshot shows the Firewall Management Center interface for a device named FTD-1. The 'Devices' tab is selected. On the left, a sidebar lists routing protocols: ECMP, BFD, OSPF, OSPFv3, EIGRP, RIP, and Policy Based Routing (with BGP expanded). Under BGP, 'IPv4' is selected. The main pane shows 'Virtual Router Properties' for 'Global'. The 'Routing' tab is active, and the 'Redistribution' sub-tab is selected. A table titled 'Redistribution' contains one row with 'Source Protocol' set to 'STATIC'. This row is highlighted with a red box. Other tabs in the 'Routing' section include Summary, High Availability, Device, Interfaces, Inline Sets, DHCP, and VTEP. Buttons for Save and Cancel are at the top right.

Enregistrez et déployez la configuration sur le FTD.

Vérifier

Configuration BGP FTD :

```
<#root>
FTD-HQ-1#
show run router

router bgp 65000
bgp log-neighbor-changes
bgp router-id vrf auto-assign
address-family ipv4 unicast
neighbor 192.168.100.1 remote-as 65001
neighbor 192.168.100.1 transport path-mtu-discovery disable
neighbor 192.168.100.1 activate

redistribute static

no auto-summary
no synchronization
exit-address-family
```

Sortie de la table FTD bgp :

```
<#root>

FTD-1#
show bgp

BGP table version is 26, local router ID is 192.168.100.2
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath
Origin codes: i - IGP, e - EGP, ? - incomplete
Network          Next Hop          Metric LocPrf Weight Path
*> 10.100.100.10/32 10.100.100.10      0          32768  ?
r> 192.168.100.0/30 192.168.100.1      1          0  65001  ?
```

Sortie de la table bgp de R1 :

```
<#root>

R1#
show ip bgp

BGP table version is 259, local router ID is 192.168.100.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found
Network          Next Hop          Metric LocPrf Weight Path
*> 10.100.100.10/32 192.168.100.2      0          0  65000  ?
*> 192.168.100.0/30  0.0.0.0          1          32768  ?
```

Sortie de la table de routage R1 :

```
<#root>

R1#
show ip route
```

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, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
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
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISP
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is not set

```
C      192.168.100.0/30 is directly connected, GigabitEthernet1
L      192.168.100.1/32 is directly connected, GigabitEthernet1
      10.0.0.0/32 is subnetted, 1 subnets
B      10.100.100.10 [20/0] via 192.168.100.2, 00:02:00
```

 Conseil : Notez que bien que le pool VPN soit 10.100.100.0/24, le FTD redistribue un sous-réseau /32 sur BGP. Cela se produit parce que le FTD crée une route statique avec un préfixe /32 pour chaque session VPN d'accès à distance. Pour optimiser cela, vous pouvez utiliser la fonctionnalité d'adresse d'agrégation BGP.

Configuration des adresses d'agrégation BGP

Configurer

S'il n'a pas encore été créé, créez un objet réseau pour les sous-réseaux VPN.

Edit Network Object



Name

Description

Network

Host Range Network FQDN

Allow Overrides

[Cancel](#)

[Save](#)

Dans l'interface utilisateur de gestion des périphériques FMC, accédez à Routing > BGP > IPv4 > Add Aggregate Address, puis sélectionnez le bouton Add.

The screenshot shows the Firewall Management Center interface for Cisco Secure Firewall Threat Defense for VMware. The device selected is FTD-1. The top navigation bar includes Overview, Analysis, Policies, Devices, Objects, Integration, Deploy, and user information (BRU-LAB \ admin). The main content area is titled "Cisco Secure Firewall Threat Defense for VMware". A left sidebar titled "Manage Virtual Routers" lists protocols: ECMP, BFD, OSPF, OSPFv3, EIGRP, RIP, Policy Based Routing, and BGP (with sub-options for IPv4, 2, and IPv6). The "Routing" tab is selected. Under "Virtual Router Properties", the "Global" tab is active. The "IPv4" section is expanded, showing "Enable IPv4": checked, "AS Number": 65000, and tabs for General, Neighbor, and Add Aggregate Address (3). The "Add Aggregate Address" tab is selected. On the right, there are tabs for Filtering, Networks, Redistribution, and Route Injection. A large red box highlights the "Add Aggregate Address" button. Another red box highlights the "+ Add" button in the top right corner of the table area. The table itself has columns: Network, Attribute Map, Advertise Map, Suppress Map, AS Set Path, and SummaryOnly. A message at the bottom of the table says "No records to display".

Dans le champ réseau, ajoutez l'objet pour le sous-réseau VPN, puis activez la case à cocher Filtrer toutes les routes à partir des mises à jour.

Add Aggregate Address



Network*

VPN-SUBNET



Attribute Map



Advertise Map



Suppress Map



Generate AS set path information

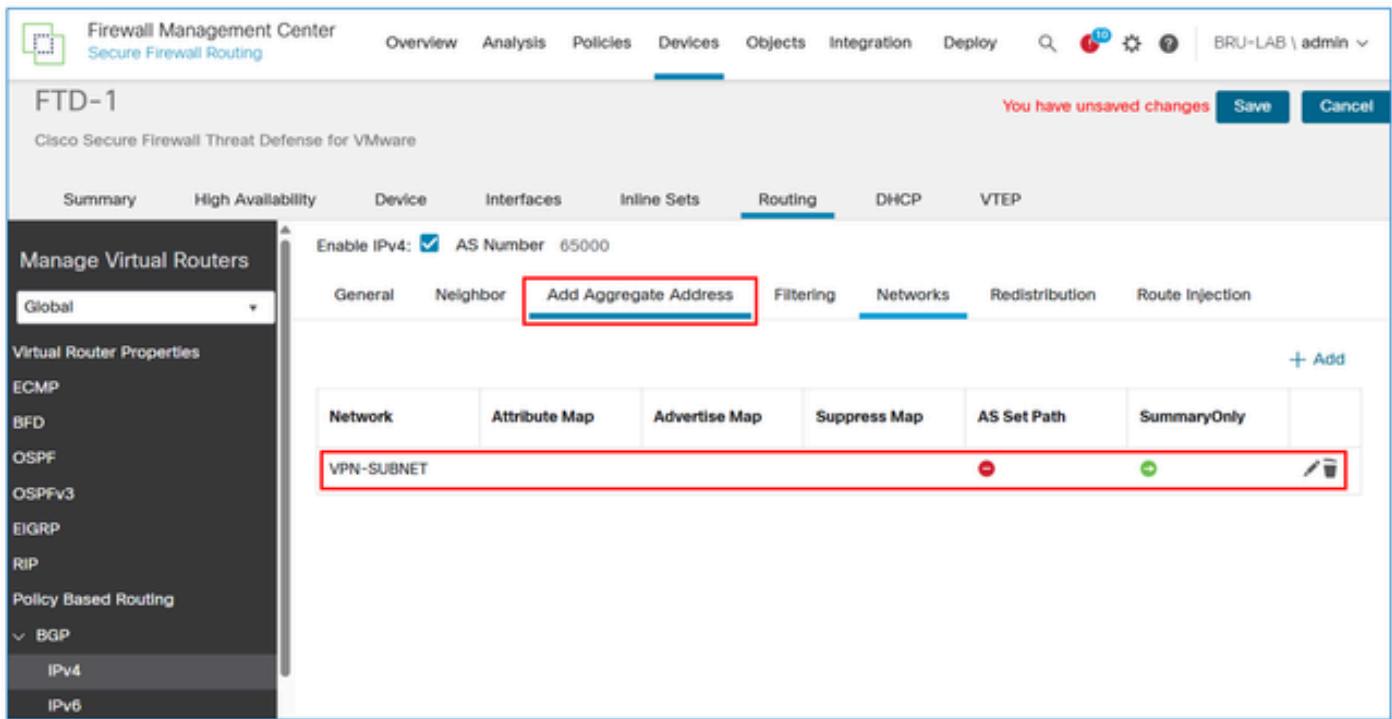
Filter all routes from updates

Cancel

OK

 Remarque : Si la case Filter all routes from updates est décochée, le FTD annonce à la fois l'adresse récapitulative et les routes VPN /32 spécifiques sur BGP. Lorsque la case est cochée, le FMC pousse la commande aggregate-address summary-only vers la configuration FTD LINA, en s'assurant que seule l'adresse récapitulative est annoncée.

Le résultat :



The screenshot shows the FMC interface for FTD-1. The left sidebar shows 'Manage Virtual Routers' with 'Global' selected. The main pane shows the 'Virtual Router Properties' for 'BGP'. Under 'BGP', 'IPv4' is selected. The 'Routing' tab is active. The 'Add Aggregate Address' tab is selected. A table below shows an entry for 'VPN-SUBNET' with a red border around it. The top right shows 'You have unsaved changes' with 'Save' and 'Cancel' buttons.

Enregistrez et déployez la configuration sur le FTD.

Vérifier

Configuration BGP FTD :

```
<#root>
FTD-1#
sh run router

router bgp 65000
bgp log-neighbor-changes
bgp router-id vrf auto-assign
address-family ipv4 unicast
neighbor 192.168.100.1 remote-as 65001
neighbor 192.168.100.1 transport path-mtu-discovery disable
neighbor 192.168.100.1 activate

redistribute static

aggregate-address 10.100.100.0 255.255.255.0 summary-only
```

```
no auto-summary
no synchronization
exit-address-family
```

Sortie de la table FTD BGP :

```
<#root>
```

```
FTD-1#
```

```
sh bgp
```

```
BGP table version is 28, local router ID is 192.168.100.2
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath
Origin codes: i - IGP, e - EGP, ? - incomplete
```

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 10.100.100.0/24	0.0.0.0		32768	i	
s> 10.100.100.10/32	10.100.100.10	0	32768	?	
r> 192.168.100.0/30	192.168.100.1	1	0	65001	?

Sortie de la table BGP de R1 :

```
<#root>
```

```
R1#
```

```
show ip bgp
```

```
BGP table version is 261, local router ID is 192.168.100.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
               r RIB-failure, S Stale, m multipath, b backup-path, f RT-Filter,
               x best-external, a additional-path, c RIB-compressed,
               t secondary path, L long-lived-stale,
Origin codes: i - IGP, e - EGP, ? - incomplete
RPKI validation codes: V valid, I invalid, N Not found
```

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 10.100.100.0/24	192.168.100.2	0	0	65000	i
*> 192.168.100.0/30	0.0.0.0	1	32768	?	

Sortie de la table de routage R1 :

```
<#root>
```

```
R1#
```

```
show ip route
```

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, m - OMP
n - NAT, Ni - NAT inside, No - NAT outside, Nd - NAT DIA
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
H - NHRP, G - NHRP registered, g - NHRP registration summary
o - ODR, P - periodic downloaded static route, l - LISPs
a - application route
+ - replicated route, % - next hop override, p - overrides from PfR
& - replicated local route overrides by connected

Gateway of last resort is not set

```
C      192.168.100.0/30 is directly connected, GigabitEthernet1
L      192.168.100.1/32 is directly connected, GigabitEthernet1
      10.0.0.0/24 is subnetted, 1 subnets
B      10.100.100.0 [20/0] via 192.168.100.2, 00:02:04
```

À propos de cette traduction

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