

مادختساب 3-ةلحرملل ڤمرهلا DMVPN نڤوكت ةڤعرفلا تاكبشلا ةددعتم ةڤعرفلا تالوحرملا

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ةمدقملا

Phase-3 Hierarchical Dynamic Multipoint VPN لكشڤي نأ فڤك لوحتامولعم ؤقڤثو اذه دوزڤ (DMVPN) عم multi-subnet subnet subn.

ةڤساسألا تاابلطتملا

تاابلطتملا

ةڤللالا عڤضاوملاب ؤفرعم كڤدل نوكت نأ Cisco ڤصوت:

- [DMVPN ب ٤ي ساس ا ٤ فرعم](#)
- [\(EIGRP\) ٤ نس حمل ا ٤ي ل خاد ل ا ٤ ب ا و ب ل ا ٤ي ج و ت ل و ك و ت و ر ب ٤ي ساس ا ٤ فرعم](#)

تا ه ج و م ل ا ن ا ن م د ك ا ت ، ٤ د د ع ت م ٤ي ع ر ف ت ا ك ب ش ع م ي م ر ه DMVPN ي ل ع ل و ص ح ل ل : ٤ ظ ح ا ل م ح ا ل ص ا ن و د ب IOS ر ا د ص ا ل غ ش ت ت ا ه ج و م د و ج و ع م . [CSCug42027](#) ل ا ط خ ل ا ح a ل ص ا ي ل ع ي و ت ح ت ت ا ك ب ش ل ا ي ف ع و ر ف ل ا ن ي ب ه ب ث د ح ت ل ا م ت ي ي ذ ل ا ق ف ن ل ا ن ي و ك ت د ر ج م ب ، [CSCug42027](#) . ا ه ب ث د ح ت ل ا م ت ي ي ت ل ا ت ا ن ا ي ب ل ا ر و ر م ٤ ك ر ح ل ش ف ت ، ٤ ف ل ت خ م ل ا ٤ي ع ر ف ل ا

٤ي ل ا ت ل ا IOS-XE و IOS ت ا ر ا د ص ا ي ف [CSCug42027](#) ل ح م ت

- ث د ح ا ل ا ت ا ر a د ص ا ل ا و 10. 3 / 3(3)S
- ث د ح ا ل ا ت a ر a د ص ا ل ا و 15. 4(3)M
- ث د ح ا ل ا T ا ر a د ص ا ل ا و 15. 4(1)T

٤ م د خ ت س م ل ا ت a ن و ك م ل ا

٤ي ل ا ت ل ا ج م ا ر ب ل a و ٤ي د a م ل a T a ن و K م ل a ت a ر a د ص ا ي ل ا د ن ت س م ل a ا ذ ه ي ف ٤ د ر a و l a T a م و ل ع م l a D ن ت س ت

- 15.5(2)T ر a د ص ا ل a ، Cisco IOS® ل غ ش ت ي ت l a Cisco 2911 Integrated Services ت a ه ج و م

٤ ص ا خ ٤ي ل م ع م ٤ئ ي ب ي ف ٤ د و ج و م l a ٤ ز ه ج a ل a ن م D ن ت س M l a ا ذ ه ي ف ٤ D ر a و l a T a م و ل ع M l a ا ش ن ا م ت T ن ا K ا ذ ا . (ي ض ا ر ت ف a) ح و س م م N ي و K ت ب D ن ت S M l a ا ذ ه ي ف ٤ M د خ T س M l a ٤ ز ه ج a ل a ع ي م ج T ا د ب ر م a ي a ل M ت ح M l a R ي ث a ت ل l K م ه ف N م D ك a T ف ، ٤ ر ش a ب M ك ت K ب ش

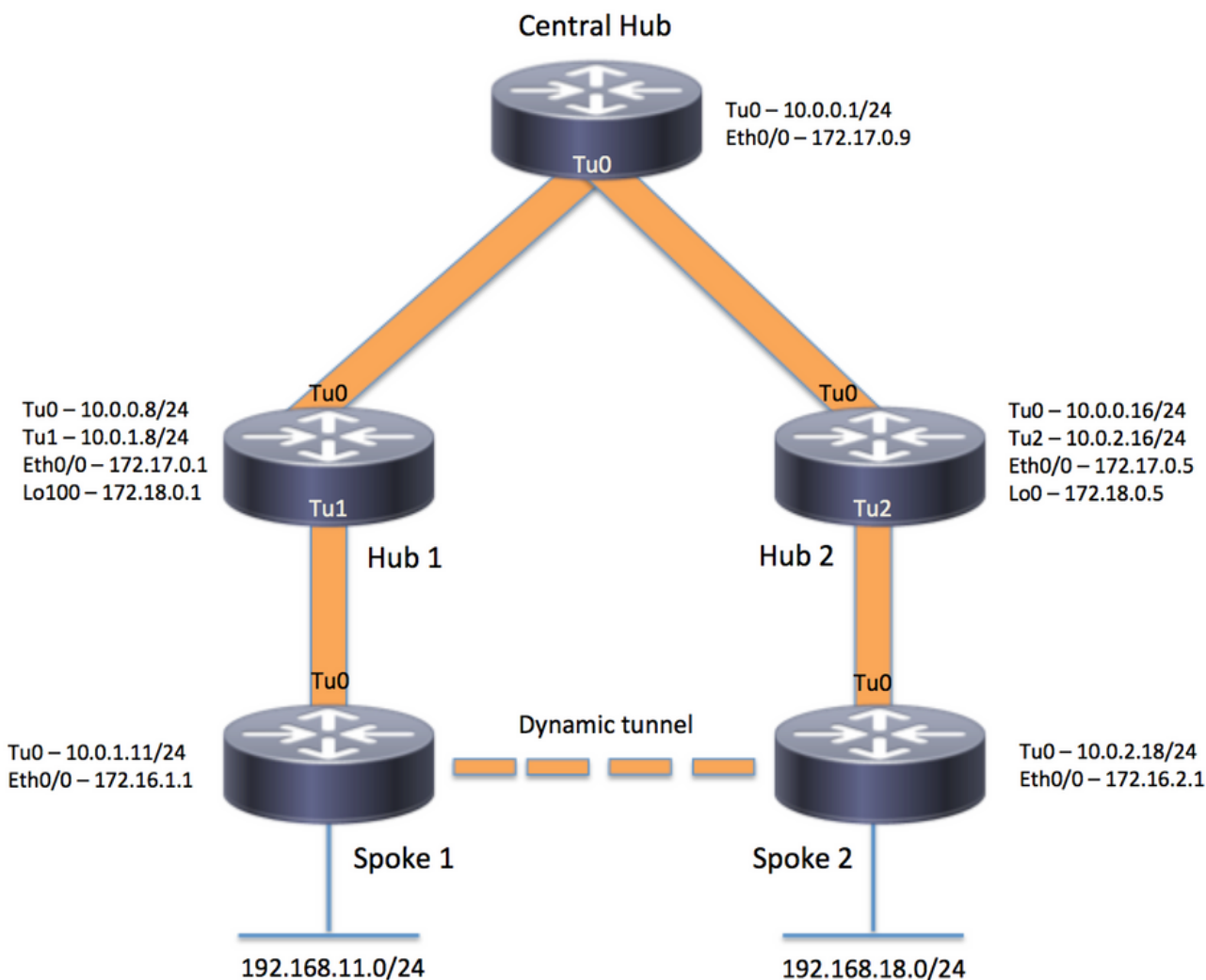
٤ي ساس ا T a م و ل ع م

٤ م ئ a ق و a د ي ق ع ت R ث ك a DMVPN ت a K ب ش T a ط خ M ب (D ح a و ي و T س M N م R ب K a) ي M ر ه l a D a د ع l a ح M س ي DMVPN ت a K ب ش a ن ب ٤ي N a K م l a ر a ج ش a ل a ي ل ع ٤ م ئ a ق l a T a ط خ M l a ح ي T ت . ٤ ر ج ش l a ي ل ع ٤ي R a م ع M l a ٤ س D ن ه l a ا ذ ه ح M س ي . ٤ي Z ك R M l a Z K a R M l l a R و ح M ل K ش T ٤ي M ي ل ق l a R و a ح M a D خ T س a B (NHRP) ٤ي ل a T l a (Hop) ٤ و ط خ l a ل ي ل ح T ل و K و T و R ب و T a N a ي B l a ع M ل M a ع T ي N a ي M ي L Q l a Z K R M l a ا ش N a B ح M س ي L a Z ي a l ه N ا F ، K ل ذ ع M و . ٤ي M ي L Q l a a ه T a l a ج M l T a N a ي B l a R و R م ٤ K ر ح ي ف M ك ح T l a ٤ ق ط N م l a ي ف T ن a K a و S ، DMVPN ٤ K ب ش L خ a D ع و R F l a N م ي a N ي B a ه B ث D ح T l a M ت ي Q a F ن a T a N a ي B l a Q F D T ط a M ن a ٤ ق B a ط M l DMVPN ٤ K ب ش T ي ط خ T ٤ي N B l a ه ذ ه ح ي T T a M K . a l M a ه S F ن Q ت و a L K ش B ٤ي M R h l a و a ٤ي M ي L Q l a l a

N ي و K T l a

D ن T S M l a ا ذ ه ي ف ٤ ح و م l a T a Z ي M l a N ي و K T l T a م و ل ع M l a K l M D ق T ، M س Q l a ا ذ ه ي ف

٤ K ب ش l l ي ط ي ط خ T l a M س R l a



تانيوكتال

لثالم اذ في نيوكتال نم طقف ةلصلل تاذا ماسقأل ني مضت متي: ةظحال

يتركمرال عزومال (Hub0)

```

version 15.5
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname central_hub
!
crypto isakmp policy 1
  encr aes 256
  hash sha256
  authentication pre-share
  group 2
crypto isakmp key cisco123 address 0.0.0.0

```

```

!
crypto ipsec transform-set transform-dmvpn esp-aes 256 esp-sha-hmac
 mode transport
!
crypto ipsec profile profile-dmvpn
 set transform-set transform-dmvpn
!
interface Loopback1
 ip address 192.168.1.1 255.255.255.0
!
interface Tunnel0
 bandwidth 1000
 ip address 10.0.0.1 255.255.255.0
 no ip redirects
 ip mtu 1400
 no ip split-horizon eigrp 1
 ip nhrp authentication test
 ip nhrp map multicast dynamic
 ip nhrp network-id 100000
 ip nhrp shortcut
 ip nhrp redirect
 ip summary-address eigrp 1 192.168.0.0 255.255.192.0
 ip tcp adjust-mss 1360
 tunnel source Ethernet0/0
 tunnel mode gre multipoint
 tunnel key 100000
 tunnel protection ipsec profile profile-dmvpn
!
interface Ethernet0/0
 ip address 172.17.0.9 255.255.255.252
!
router eigrp 1
 network 10.0.0.0 0.0.0.255
 network 192.168.1.0
!
ip route 0.0.0.0 0.0.0.0 172.17.0.10
!
end

```

(1 عزومل) عزومل 1 ةقطنملا

```

version 15.5
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname hub_1
!
crypto isakmp policy 1
 encr aes 256
 hash sha256
 authentication pre-share
 group 2
crypto isakmp key cisco123 address 0.0.0.0
!

```

```
crypto ipsec transform-set transform-dmvpn esp-aes 256 esp-sha-hmac
 mode transport
!
crypto ipsec profile profile-dmvpn
 set transform-set transform-dmvpn
!
crypto ipsec profile profile-dmvpn-1
 set transform-set transform-dmvpn
!
interface Loopback1
 ip address 192.168.8.1 255.255.255.0
!
interface Loopback100
 ip address 172.18.0.1 255.255.255.252
!
interface Tunnel0
 bandwidth 1000
 ip address 10.0.0.8 255.255.255.0
 no ip redirects
 ip mtu 1400
 no ip split-horizon eigrp 1
 ip nhrp authentication test
 ip nhrp network-id 100000
 ip nhrp nhs 10.0.0.1 nbma 172.17.0.9 multicast
 ip nhrp shortcut
 ip nhrp redirect
 ip summary-address eigrp 1 192.168.8.0 255.255.248.0
 ip tcp adjust-mss 1360
 tunnel source Ethernet0/0
 tunnel mode gre multipoint
 tunnel key 100000
 tunnel protection ipsec profile profile-dmvpn
!
interface Tunnel1
 bandwidth 1000
 ip address 10.0.1.8 255.255.255.0
 no ip redirects
 ip mtu 1400
 ip nhrp authentication test
 ip nhrp map multicast dynamic
 ip nhrp network-id 100000
 ip nhrp redirect
 ip summary-address eigrp 1 192.168.8.0 255.255.248.0
 ip summary-address eigrp 1 192.168.100.0 255.255.252.0
 ip tcp adjust-mss 1360
 tunnel source Loopback100
 tunnel mode gre multipoint
 tunnel key 100000
 tunnel protection ipsec profile profile-dmvpn-1
!
interface Ethernet0/0
 ip address 172.17.0.1 255.255.255.252
!
router eigrp 1
 network 10.0.0.0 0.0.0.255
 network 10.0.1.0 0.0.0.255
 network 192.168.8.0
!
ip route 0.0.0.0 0.0.0.0 172.17.0.2
!
end
```

(2 عزوم ل) عزوم 2 ةقطنم ل

```
version 15.5
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname hub_2
!
crypto isakmp policy 1
  encr aes 256
  hash sha256
  authentication pre-share
  group 2
crypto isakmp key cisco123 address 0.0.0.0
!
crypto ipsec transform-set transform-dmvpn esp-aes 256 esp-sha-hmac
mode transport
!
crypto ipsec profile profile-dmvpn
set transform-set transform-dmvpn
!
crypto ipsec profile profile-dmvpn-1
set transform-set transform-dmvpn
!
interface Loopback0
 ip address 172.18.0.5 255.255.255.252
!
interface Loopback1
 ip address 192.168.16.1 255.255.255.0
!
interface Tunnel0
 bandwidth 1000
 ip address 10.0.0.16 255.255.255.0
 no ip redirects
 ip mtu 1400
 ip nhrp authentication test
 ip nhrp network-id 100000
 ip nhrp holdtime 360
 ip nhrp nhs 10.0.0.1 nbma 172.17.0.9 multicast
 ip nhrp shortcut
 ip nhrp redirect
 ip summary-address eigrp 1 192.168.16.0 255.255.248.0
 tunnel source Ethernet0/0
 tunnel mode gre multipoint
 tunnel key 100000
 tunnel protection ipsec profile profile-dmvpn
!
interface Tunnel2
 bandwidth 1000
 ip address 10.0.2.16 255.255.255.0
 no ip redirects
 ip mtu 1400
 ip nhrp authentication test
 ip nhrp map multicast dynamic
 ip nhrp network-id 100000
 ip nhrp holdtime 360
 ip nhrp redirect
```

```

ip summary-address eigrp 1 192.168.16.0 255.255.248.0
ip summary-address eigrp 1 192.168.100.0 255.255.252.0
tunnel source Loopback0
tunnel mode gre multipoint
tunnel key 100000
tunnel protection ipsec profile profile-dmvpn-1
!
interface Ethernet0/0
 ip address 172.17.0.5 255.255.255.252
!
router eigrp 1
 network 10.0.0.0 0.0.0.255
 network 10.0.2.0 0.0.0.255
 network 192.168.16.0
!
ip route 0.0.0.0 0.0.0.0 172.17.0.6
!
end

```

(1 تم لكت) ت ث د ح ت 1 ة ق ط ن م ل ا

```

version 15.5
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname spoke_1
!
crypto isakmp policy 1
 encr aes 256
 hash sha256
 authentication pre-share
 group 2
crypto isakmp key cisco123 address 0.0.0.0
crypto isakmp keepalive 10
!
crypto ipsec transform-set transform-dmvpn esp-aes 256 esp-sha-hmac
 mode transport
!
crypto ipsec profile profile-dmvpn
 set transform-set transform-dmvpn
!
interface Loopback1
 ip address 192.168.11.1 255.255.255.0
!
interface Tunnel0
 bandwidth 1000
 ip address 10.0.1.11 255.255.255.0
 no ip redirects
 ip mtu 1400
 ip nhrp authentication test
 ip nhrp network-id 100000
 ip nhrp nhs 10.0.1.8 nbma 172.18.0.1 multicast
 ip nhrp shortcut
 ip tcp adjust-mss 1360
 tunnel source Ethernet0/0

```

```
tunnel mode gre multipoint
tunnel key 100000
tunnel protection ipsec profile profile-dmvpn
!
interface Ethernet0/0
 ip address 172.16.1.1 255.255.255.252
!
router eigrp 1
 network 10.0.0.0 0.0.0.255
 network 10.0.1.0 0.0.0.255
 network 192.168.11.0
!
ip route 0.0.0.0 0.0.0.0 172.16.1.2
!
end
```

2 ملكت) 2 ةقطنملا

```
version 15.5
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname spoke_2
!
crypto isakmp policy 1
 encr aes 256
 hash sha256
 authentication pre-share
 group 2
crypto isakmp key cisco123 address 0.0.0.0
crypto isakmp keepalive 10
!
crypto ipsec transform-set transform-dmvpn esp-aes 256 esp-sha-hmac
 mode transport
!
crypto ipsec profile profile-dmvpn
 set transform-set transform-dmvpn
!
interface Loopback1
 ip address 192.168.18.1 255.255.255.0
!
interface Tunnel0
 bandwidth 1000
 ip address 10.0.2.18 255.255.255.0
 no ip redirects
 ip mtu 1400
 ip nhrp authentication test
 ip nhrp network-id 100000
 ip nhrp nhs 10.0.2.16 nbma 172.18.0.5 multicast
 ip nhrp shortcut
 ip tcp adjust-mss 1360
 tunnel source Ethernet0/0
 tunnel mode gre multipoint
 tunnel key 100000
 tunnel protection ipsec profile profile-dmvpn
```



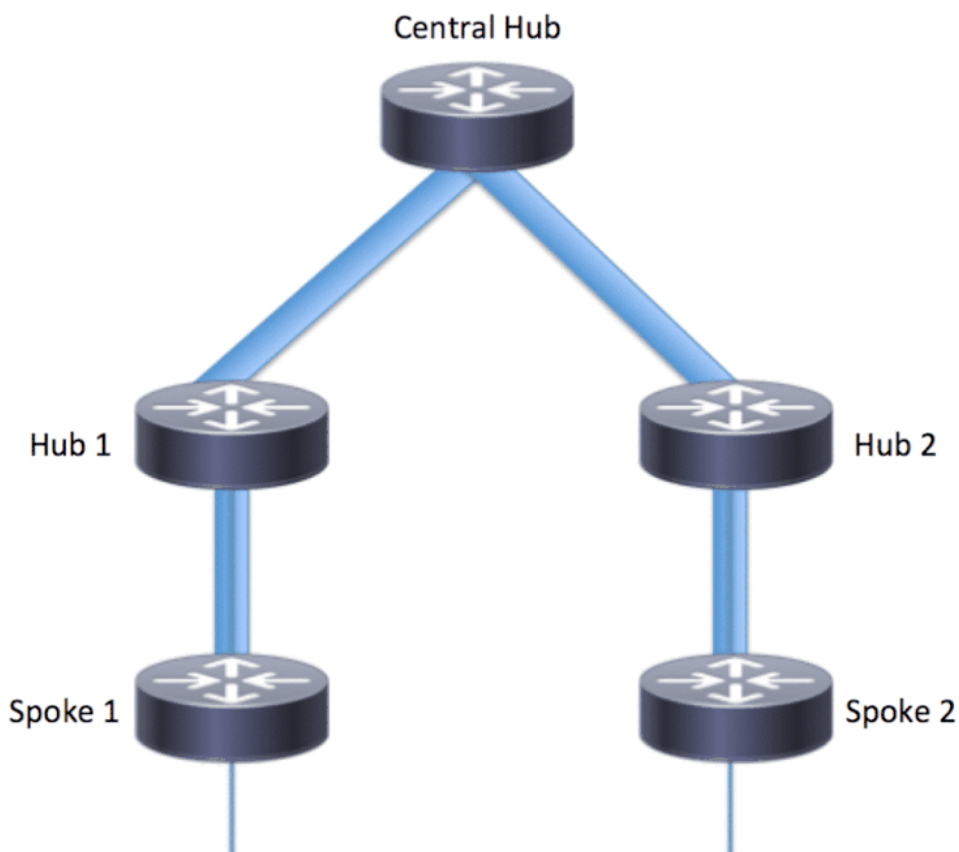
```

!
interface Ethernet0/0
 ip address 172.16.2.1 255.255.255.252
!
router eigrp 1
 network 10.0.2.0 0.0.0.255
 network 192.168.18.0
!
ip route 0.0.0.0 0.0.0.0 172.16.2.2
!
end

```

NHRP مزمح قفدتو تانايبلا مهف

درلا قفدتو NHRP قود ب ل ط ه ع ب ت ي ي ذ ل ل و أ ل ل ت ا ن ا ي ب ل ا م ز م ح ق ف د ت ة ر و ص ل ا ه ذ ه ص ر ع ت



ل و أ ل ل ت ا ن ا ي ب ل ا م ز م ح ق ف د ت

192.168.11.1 = ردصملا ، 192.168.18.10 = ةهجولا ، 1 Talk نم ICMP لاصتا رابتخا ادب . 1 ةوطخلا

10.0.1.8 يه ةيلالاتلا ةوطخلا ، هاندأ رهظي امك . 192.168.18.10 ل راسملا شحب ارجا متي . 1 (روحملا قفنلا ناوع)

2. عمو Tunnel0، ىل ع 192.168.18.10 ةهوجل NHRP ل تقؤملا نيزختلا ةركاذ نع شحبلا مت .
ةلحرمل هذه يف لاخدا ي ا ىل ع روثعل متي مل ،كلذ .
3. ىل ع 10.0.1.8 ي ا ،ةيلاتلا ةوطخلل NHRP ل تقؤملا نيزختلا ةركاذ نع شحبلا ءارجا متي .
ل.يغشتلا ديق ريفشتلا لمع ةسلجو دوجوم لاخدا ل ،هاندا حضوم وه امك Tunnel0.
4. قفنلا ربع Hub1 ي ا ،ةيلاتلا ةوطخلل ىل ع ICMP ىل ص بل ط ةمزح هيجوت ةداعا متت .
دوجوملا .

<#root>

```
spoke_1#show ip route 192.168.18.10
```

```
Routing entry for 192.168.0.0/18, supernet
  Known via "eigrp 1", distance 90, metric 5248000, type internal
  Redistributing via eigrp 1
  Last update from 10.0.1.8 on Tunnel0, 02:30:37 ago
  Routing Descriptor Blocks:
  * 10.0.1.8, from 10.0.1.8, 02:30:37 ago, via Tunnel0
    Route metric is 5248000, traffic share count is 1
    Total delay is 105000 microseconds, minimum bandwidth is 1000 Kbit
    Reliability 255/255, minimum MTU 1400 bytes
    Loading 1/255, Hops 2
```

```
spoke_1#show ip nhrp
10.0.1.8/32 via 10.0.1.8
  Tunnel0 created 02:31:32, never expire
  Type: static, Flags: used
  NBMA address: 172.18.0.1
```

1 عزوملا ىل ع ICMP ةمزح ي قلت مت 2. ةوطخلل

1. قفنلا ناو نع 10.0.0.1 ي ه ةيلاتلا ةوطخلل 192.168.18.10 ل راسملا شحب ءارجا متي .
(0 عزومل .
2. ل نمض نراق رخا ىل تل سرأ نو كي نا جاتحت ةمزح لاو ،جورخلل ةطقن س ي ل Hub1 نا ام ب .
Talk 1 ىل ع NHRP هيجوت ةداعا /ا طخ لس ري 1 Hub ،ةباحس DMVPN هسفن .
3. Hub0 ىل تانا ي بل ةمزح هيجوت ةداعا متت ،تقوللا س فن ي ف .

<#root>

```
*Apr 13 19:06:07.592: NHRP: Send Traffic Indication via Tunnel1 vrf 0, packet size: 96
```

```
*Apr 13 19:06:07.592: src: 10.0.1.8, dst: 192.168.11.1
*Apr 13 19:06:07.592: (F) afn: AF_IP(1), type: IP(800), hop: 255, ver: 1
*Apr 13 19:06:07.592: shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.592: pktsz: 96 extoff: 68
```

```
*Apr 13 19:06:07.592: (M) traffic code: redirect(0)
```

```
*Apr 13 19:06:07.592: src NBMA: 172.18.0.1
*Apr 13 19:06:07.592: src protocol: 10.0.1.8, dst protocol: 192.168.11.1
*Apr 13 19:06:07.592: Contents of nhrp traffic indication packet:
```

```
*Apr 13 19:06:07.592:          45 00 00 64 00 01 00 00 FE 01 1E 3C C0 A8 0B 01
*Apr 13 19:06:07.592:          C0 A8 12 0A 08 00 A1 C8 00 01 00
```

Hub 0 إلى ICMP مزمح يقلت مت 3. ةوطخلال

1. Hub2 ق فن ناووع) 10.0.0.16 يه ةيلالاتلا ةوطخلال 192.168.18.10 ل راسملا شحب ءارجا متي Tunnel0 إلى
2. هسفن لا إلى تلسرأ نوكي نأ جاتحت ةمزل او جورخلال ةطقن تسي ل 0 ةرصلنا أمب نأ ليشت NHRP ل لسري 0 ةرصلنا كذل، نراق هسفن لا قي رطنع ةباحس DMVPN 1. ةرصلنا لالخ نم 1 ملكتي
3. عزوملا إلى تانايبلا ةمزه هجوت ةءاع مت.

<#root>

```
*Apr 13 19:06:07.591: NHRP: Send Traffic Indication via Tunnel0 vrf 0, packet size: 96
```

```
*Apr 13 19:06:07.591: src: 10.0.0.1, dst: 192.168.11.1
*Apr 13 19:06:07.591: (F) afn: AF_IP(1), type: IP(800), hop: 255, ver: 1
*Apr 13 19:06:07.591: shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.591: pktsz: 96 extoff: 68
*Apr 13 19:06:07.591: (M) traffic code: redirect(0)

*Apr 13 19:06:07.591: src NBMA: 172.17.0.9
*Apr 13 19:06:07.591: src protocol: 10.0.0.1, dst protocol: 192.168.11.1
*Apr 13 19:06:07.592: Contents of nhrp traffic indication packet:
*Apr 13 19:06:07.592:          45 00 00 64 00 01 00 00 FD 01 1F 3C C0 A8 0B 01
*Apr 13 19:06:07.592:          C0 A8 12 0A 08 00 A1 C8 00 01 00
```

Hub 2 إلى ICMP مزمح يقلت مت 4. ةوطخلال

1. ل ق فنل ناووع) 10.0.2.18 يه ةيلالاتلا ةوطخلال 192.168.18.10 ل راسملا شحب ءارجا متي TALK2) ق فنل ي ف 2
2. ل نمض نراق رخآ إلى تلسرأ نوكي نأ جاتحت ةمزل او جورخلال ةطقن سيل Hub 2 نأ أمب نأ ليشت NHRP ل لسري Hub 2، ةباحس DMVPN هسفن Hub 0. لالخ نم 1 ملكتي نأ ريغت
3. Talk 2 إلى تانايبلا ةمزه هجوت ةءاع مت.

<#root>

```
*Apr 13 19:06:07.592: NHRP: Send Traffic Indication via Tunnel0 vrf 0, packet size: 96
```

```
*Apr 13 19:06:07.593: src: 10.0.0.16, dst: 192.168.11.1
*Apr 13 19:06:07.593: (F) afn: AF_IP(1), type: IP(800), hop: 255, ver: 1
*Apr 13 19:06:07.593: shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.593: pktsz: 96 extoff: 68
*Apr 13 19:06:07.593: (M) traffic code: redirect(0)

*Apr 13 19:06:07.593: src NBMA: 172.17.0.5
```

```
*Apr 13 19:06:07.593:      src protocol: 10.0.0.16, dst protocol: 192.168.11.1
*Apr 13 19:06:07.593:      Contents of nhrp traffic indication packet:
*Apr 13 19:06:07.593:          45 00 00 64 00 01 00 00 FC 01 20 3C C0 A8 0B 01
*Apr 13 19:06:07.593:          C0 A8 12 0A 08 00 A1 C8 00 01 00
```

Talk 2 ىل ICMP ةمزح يقلت مت 5 ةوطخلال

ىل ICMP بلط ديعي هنإ. ايلحم ةلصتم ةكبش يهو 192.168.18.10 نع راسملا شحب ارجا متي ةهوجل.

NHRP ليلحت بلط قفدت

1 متثداح

1. 192.168.18.10 ةهوجل 1 عزوملا ةطساوب ةلسررملا NHRP تامولعم يقلت مت.
2. 192.168.18.10/32 ل لمتمكم ريغ NHRP تقوم نيخت ةركاذ ل اخلدا جارجا متي.
3. Tunnel0 ىل (Hub 1) 10.0.1.8 يه ةيلالاتلا ةوطخلال 192.168.18.10 ل راسملا شحب ارجا متي.
4. ىل 10.0.1.8 ةيلالاتلا ةوطخلال NHRP ل تقوملا نيختلا ةركاذ نع شحبلا ارجا متي (قفن دوجوي) ريفشتلا ذخأم ليغشت اضيا متو ل اخلدا ىل روثعلا مت Tunnel0.
5. ىل Hub 1 ربع 192.168.18.10/32 ل NHRP ليلحت بلط لسري 1 Talk ىل ملكت دوجوملا ربع Hub 1 ليلقتلا Hub1 قفن.

<#root>

```
*Apr 13 19:06:07.596: NHRP:
```

```
Receive Traffic Indication via Tunnel0
```

```
vrf 0, packet size: 96
```

```
*Apr 13 19:06:07.596: (F) afn: AF_IP(1), type: IP(800), hop: 255, ver: 1
```

```
*Apr 13 19:06:07.596:      shtl: 4(NSAP), sstl: 0(NSAP)
```

```
*Apr 13 19:06:07.596:      pktsz: 96 extoff: 68
```

```
*Apr 13 19:06:07.596: (M) traffic code: redirect(0)
```

```
*Apr 13 19:06:07.596:      src NBMA: 172.18.0.1
```

```
*Apr 13 19:06:07.596:      src protocol: 10.0.1.8, dst protocol: 192.168.11.1
```

```
*Apr 13 19:06:07.596:      Contents of nhrp traffic indication packet:
```

```
*Apr 13 19:06:07.596:          45 00 00 64 00 01 00 00 FE 01 1E 3C C0 A8 0B 01
```

```
*Apr 13 19:06:07.596:          C0 A8 12 0A 08 00 A1 C8 00 01 00
```

```
*Apr 13 19:06:07.596: NHRP: Attempting to create instance PDB for (0x0)
```

<#root>

```
*Apr 13 19:06:07.609: NHRP:
```

```
Send Resolution Request via Tunnel0
```

```
vrf 0, packet size: 84
```

```
*Apr 13 19:06:07.609: src: 10.0.1.11, dst: 192.168.18.10
```

```
*Apr 13 19:06:07.609: (F) afn: AF_IP(1), type: IP(800), hop: 255, ver: 1
```

```
*Apr 13 19:06:07.609:      shtl: 4(NSAP), sstl: 0(NSAP)
```

```

*Apr 13 19:06:07.609:      pktsz: 84 extoff: 52
*Apr 13 19:06:07.609: (M) flags: "router auth src-stable nat ", reqid: 3
*Apr 13 19:06:07.609:      src NBMA: 172.16.1.1
*Apr 13 19:06:07.609:      src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.609: (C-1) code: no error(0)
*Apr 13 19:06:07.609:      prefix: 32, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.609:      addr_len: 0(NSAP), subaddr_len: 0(NSAP), proto_len: 0, pref: 0

```

1 عزوم ل

1. 192.168.18.1/32 ةهوجلل Talk 1 نم NHRP رارق بلط يقلت مت
2. Tunnel0 لىل (Hub 0) 10.0.0.1 يه ةيلاتلا ةوطخلال 192.168.18.1 ل راسملا ثحب ءارجا متي
3. جورخلا ةطقن تسيلا ةيلحملا ةدقعالاو هسفن وه جرخملاو لخدملا NHRP ةكبش فرعم
4. لىل 10.0.0.1 ةيلاتلا ةوطخلال NHRP ل تقوملا نيختلا ةركاذ نع ثحبلا ءارجا متي (دوجوم قفنلا) ريفشلا ذخأم ليغشت متي و لاخ ءلال لىل ع روثل متي Tunnel0،
5. لىل قفنلا ربع 0 بكري نأ 192.168.18.10/32 ل NHRP لىلحت بلط Hub1 ل سري

<#root>

```
*Apr 13 19:06:07.610: NHRP:
```

Receive Resolution Request via Tunnel1

```

vrf 0, packet size: 84
*Apr 13 19:06:07.610: (F) afn: AF_IP(1), type: IP(800), hop: 255, ver: 1
*Apr 13 19:06:07.610:      shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.610:      pktsz: 84 extoff: 52
*Apr 13 19:06:07.610: (M) flags: "router auth src-stable nat ", reqid: 3
*Apr 13 19:06:07.610:      src NBMA: 172.16.1.1
*Apr 13 19:06:07.610:      src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.610: (C-1) code: no error(0)
*Apr 13 19:06:07.610:      prefix: 32, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.610:      addr_len: 0(NSAP), subaddr_len: 0(NSAP), proto_len: 0, pref: 0

```

```
*Apr 13 19:06:07.610: NHRP:
```

Forwarding Resolution Request via Tunnel0

```

vrf 0, packet size: 104
*Apr 13 19:06:07.610:      src: 10.0.0.8, dst: 192.168.18.10
*Apr 13 19:06:07.610: (F) afn: AF_IP(1), type: IP(800), hop: 254, ver: 1
*Apr 13 19:06:07.610:      shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.610:      pktsz: 104 extoff: 52
*Apr 13 19:06:07.610: (M) flags: "router auth src-stable nat ", reqid: 3
*Apr 13 19:06:07.610:      src NBMA: 172.16.1.1
*Apr 13 19:06:07.610:      src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.610: (C-1) code: no error(0)
*Apr 13 19:06:07.610:      prefix: 32, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.610:      addr_len: 0(NSAP), subaddr_len: 0(NSAP), proto_len: 0, pref: 0

```

0 عزوم ل

1. عزوملا ةطساوب كلذو 192.168.18.1/32 ةهوجلل NHRP لىلحت بلط يقلت مت
2. Tunnel0 لىل (Hub 2) 10.0.0.16 يه ةيلاتلا ةوطخلال 192.168.18.1 ل راسملا ثحب ءارجا متي

3. جوارخ لاطقن تسيل ةيلحم لاطقن ةسفن وه جرخم لاطقن ل NHRP ةكبش فرعم .
4. لىل 10.0.0.16 ةيلال ةوطخل ل NHRP ل تقوم ل نيزختل ةركاذ نع ثحب ل اءارج م تي (دوجوم قفنل) ريفشتل ذأم لىغشت م تي و لاطخال لىل ة روثع ل م تي ، Tunnel0
5. دوجوم ل قفنل ربع 2 Hub لىل 192.168.18.1/32 ل NHRP لىل لحت بلط 0 عزوم ل لسري .

<#root>

*Apr 13 19:06:07.611: NHRP:

Receive Resolution Request via Tunnel0

```
vrf 0, packet size: 104
*Apr 13 19:06:07.611: (F) afn: AF_IP(1), type: IP(800), hop: 254, ver: 1
*Apr 13 19:06:07.611:      shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.611:      pktsz: 104 extoff: 52
*Apr 13 19:06:07.611: (M) flags: "router auth src-stable nat ", reqid: 3
*Apr 13 19:06:07.611:      src NBMA: 172.16.1.1
*Apr 13 19:06:07.611:      src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.611: (C-1) code: no error(0)
*Apr 13 19:06:07.611:      prefix: 32, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.611:      addr_len: 0(NSAP), subaddr_len: 0(NSAP), proto_len: 0, pref: 0
```

*Apr 13 19:06:07.611: NHRP:

Forwarding Resolution Request via Tunnel0

```
vrf 0, packet size: 124
*Apr 13 19:06:07.611: src: 10.0.0.1, dst: 192.168.18.10
*Apr 13 19:06:07.611: (F) afn: AF_IP(1), type: IP(800), hop: 253, ver: 1
*Apr 13 19:06:07.611:      shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.612:      pktsz: 124 extoff: 52
*Apr 13 19:06:07.612: (M) flags: "router auth src-stable nat ", reqid: 3
*Apr 13 19:06:07.612:      src NBMA: 172.16.1.1
*Apr 13 19:06:07.612:      src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.612: (C-1) code: no error(0)
*Apr 13 19:06:07.612:      prefix: 32, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.612:      addr_len: 0(NSAP), subaddr_len: 0(NSAP), proto_len: 0, pref: 0
```

2 عزوم ل

1. Hub 0 ةطساوب كلذو ، 192.168.18.10/32 ةه جول ل Talk 1 نم نHRP لىل لحت بلط ي قلت م تي .
2. لىل 10.0.2.18 يه ةيلال ةوطخل ، 192.168.18.10 ل راسم ل ثحب ل اءارج م تي (دوجوم قفنل) ريفشتل ذأم لىغشت م تي و لاطخال لىل ة روثع ل م تي ، Tunnel2
3. جوارخ لاطقن تسيل ةيلحم لاطقن ةسفن وه جرخم لاطقن ل NHRP ةكبش فرعم .
4. 2 قفنل لىل 10.0.2.18 ةيلال ةوطخل ل NHRP ل تقوم ل نيزختل ةركاذ نع ثحب ل م تي (دوجوم قفنل) ريفشتل ذأم لىغشت م تي و لاطخال لىل ة روثع ل م تي ، Tunnel2
5. ربع 2 ثحت لىل 192.168.18.1/32 ل NHRP لىل لحت بلط ه جوت ةءاع اب 2 روحم ل موق ي دوجوم ل قفنل

<#root>

*Apr 13 19:06:07.613: NHRP:

Receive Resolution Request via Tunnel0

```

vrf 0, packet size: 124
*Apr 13 19:06:07.613: (F) afn: AF_IP(1), type: IP(800), hop: 253, ver: 1
*Apr 13 19:06:07.613:      shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.613:      pktsz: 124 extoff: 52
*Apr 13 19:06:07.613: (M) flags: "router auth src-stable nat ", reqid: 3
*Apr 13 19:06:07.613:      src NBMA: 172.16.1.1
*Apr 13 19:06:07.613:      src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.613: (C-1) code: no error(0)
*Apr 13 19:06:07.613:      prefix: 32, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.613:      addr_len: 0(NSAP), subaddr_len: 0(NSAP), proto_len: 0, pref: 0

*Apr 13 19:06:07.613: NHRP:

```

Forwarding Resolution Request via Tunnel2

```

vrf 0, packet size: 144
*Apr 13 19:06:07.613: src: 10.0.2.16, dst: 192.168.18.10
*Apr 13 19:06:07.613: (F) afn: AF_IP(1), type: IP(800), hop: 252, ver: 1
*Apr 13 19:06:07.613:      shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.613:      pktsz: 144 extoff: 52
*Apr 13 19:06:07.613: (M) flags: "router auth src-stable nat ", reqid: 3
*Apr 13 19:06:07.613:      src NBMA: 172.16.1.1
*Apr 13 19:06:07.613:      src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.613: (C-1) code: no error(0)
*Apr 13 19:06:07.613:      prefix: 32, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.613:      addr_len: 0(NSAP), subaddr_len: 0(NSAP), proto_len: 0, pref: 0

```

2 قطن

1. عزم الة طساوب كلذو، 192.168.18.1/32 هوجولل NHRP ليلحت بلط يقلت متي.
2. ايلحم ةلصتم ةكبش يهو، 192.168.18.10 نع راسملا ثحب ارجا متي.
3. /24 ةئدابلا، 192.168.18.10 ل لجال يلع درلا عاشناب موقويوجورخال ةطقن وه Talk 2
4. تامولعم مادختساب (Talk 1) 10.0.1.11 ل NHRP ل تقوملا نيزختلا ةركاذ لاخدا جردي Talk 2 نHRP ليلحت بلط نم.
5. Talk 1 ب صاخلا NBMA ناونع = ةديعب ةياهن ةطقن عم VPN قفن ادبب موقوي Talk 2. يكيماينيدلا قفنلا لوح ضوافتلا متي.
6. قفنلا ربع Talk 1 لىلا 192.168.18.10/24 ل NHRP رارق يلع درلا لسري Talk 2 كلذ دعب وتلل هوانب مت يذلا يكيماينيدلا.

<#root>

```

*Apr 13 19:06:07.613: NHRP: Receive Resolution Request via Tunnel0 vrf 0, packet size: 144

*Apr 13 19:06:07.613: (F) afn: AF_IP(1), type: IP(800), hop: 252, ver: 1
*Apr 13 19:06:07.613:      shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.613:      pktsz: 144 extoff: 52
*Apr 13 19:06:07.613: (M) flags: "router auth src-stable nat ", reqid: 3
*Apr 13 19:06:07.613:      src NBMA: 172.16.1.1
*Apr 13 19:06:07.613:      src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.614: (C-1) code: no error(0)
*Apr 13 19:06:07.614:      prefix: 32, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.614:      addr_len: 0(NSAP), subaddr_len: 0(NSAP), proto_len: 0, pref: 0

```

```

*Apr 13 19:06:07.672: NHRP: Send Resolution Reply via Tunnel0 vrf 0, packet size: 172

```

```

*Apr 13 19:06:07.672: src: 10.0.2.18, dst: 10.0.1.11
*Apr 13 19:06:07.672: (F) afn: AF_IP(1), type: IP(800), hop: 255, ver: 1
*Apr 13 19:06:07.672: shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.672: pktsz: 172 extoff: 60
*Apr 13 19:06:07.672: (M) flags: "router auth dst-stable unique src-stable nat ", reqid: 3
*Apr 13 19:06:07.672: src NBMA: 172.16.1.1
*Apr 13 19:06:07.672: src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.672: (C-1) code: no error(0)
*Apr 13 19:06:07.672: prefix: 24, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.672: addr_len: 4(NSAP), subaddr_len: 0(NSAP), proto_len: 4, pref: 0
*Apr 13 19:06:07.672: client NBMA: 172.16.2.1
*Apr 13 19:06:07.672: client protocol: 10.0.2.18

```

1 تحديث الترتيب

1. ربع 24 / شبكة 192.168.18.10، NHRP لي حلح تى لى ع درلا ي قلى متي .
2. ة و ط خ ل ا ع م 192.168.18.0/24 ل NHRP ل ت ق و م ل ا ن ي ن خ ت ل ا ة ك ا ذ ل ا خ د ا ث ي د ح ت ن ا ل ا م ت ي
= 10.0.2.18، NBMA = 172.16.2.1
3. = 10.0.2.18 ة ي ل ل ا ل ا ة و ط خ ل ا ، 192.168.18.10 ة ك ب ش ل RIB ي ف NHRP ر ا س م ة ف ا ض ا م ت ت .

<#root>

```

*Apr 13 19:06:07.675: NHRP: Receive Resolution Reply via Tunnel0 vrf 0, packet size: 232

*Apr 13 19:06:07.675: (F) afn: AF_IP(1), type: IP(800), hop: 252, ver: 1
*Apr 13 19:06:07.675: shtl: 4(NSAP), sstl: 0(NSAP)
*Apr 13 19:06:07.675: pktsz: 232 extoff: 60
*Apr 13 19:06:07.675: (M) flags: "router auth dst-stable unique src-stable nat ", reqid: 3
*Apr 13 19:06:07.675: src NBMA: 172.16.1.1
*Apr 13 19:06:07.675: src protocol: 10.0.1.11, dst protocol: 192.168.18.10
*Apr 13 19:06:07.675: (C-1) code: no error(0)
*Apr 13 19:06:07.675: prefix: 24, mtu: 17912, hd_time: 7200
*Apr 13 19:06:07.675: addr_len: 4(NSAP), subaddr_len: 0(NSAP), proto_len: 4, pref: 0
*Apr 13 19:06:07.675: client NBMA: 172.16.2.1
*Apr 13 19:06:07.675: client protocol: 10.0.2.18

*Apr 13 19:06:07.676: NHRP: Adding route entry for 192.168.18.0/24 () to RIB

*Apr 13 19:06:07.676: NHRP: Route addition to RIB Successful

*Apr 13 19:06:07.676: NHRP: Route watch started for 192.168.18.0/23

*Apr 13 19:06:07.676: NHRP: Adding route entry for 10.0.2.18/32 (Tunnel0) to RIB

*Apr 13 19:06:07.676: NHRP: Route addition to RIB Successful .

```

<#root>


```
spoke_1#show ip route 192.168.18.10
Routing entry for 192.168.18.0/24
```

Known via "nhrp"

```
, distance 250, metric 1
  Last update from 10.0.2.18 00:09:46 ago
  Routing Descriptor Blocks:
    *
  10.0.2.18
    , from 10.0.2.18, 00:09:46 ago
      Route metric is 1, traffic share count is 1
      MPLS label: none
```

ةحصلا نم ققحتلا

ءالمعلل) (Cisco نم رماوأل رطس ةهجاو للحم) Cisco CLI Analyzer مءدي :ةظالم رطس ةهجاو للحم) Cisco CLI Analyzer مءختسا .ةني عم show رماوأل (طقف نبلجس ملل show رمالا جءم ل ليلحت ضرعل (Cisco نم رماوأل

NHRP راصتخا لاخءا نيوكت متي يا ،م لكتملا قفنلا عاشن لباق

<#root>

```
spoke_1#show ip nhrp
10.0.1.8/32 via 10.0.1.8
  Tunnel0 created 02:19:32, never expire
  Type: static, Flags: used
  NBMA address: 172.18.0.1
spoke_1#
```

```
spoke_1#show ip route next-hop-override
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
       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, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override
```

Gateway of last resort is 172.16.1.2 to network 0.0.0.0

```
S*   0.0.0.0/0 [1/0] via 172.16.1.2
     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
D     10.0.0.0/24 [90/5120000] via 10.0.1.8, 02:20:14, Tunnel0
C     10.0.1.0/24 is directly connected, Tunnel0
L     10.0.1.11/32 is directly connected, Tunnel0
D     10.0.2.0/24 [90/6681600] via 10.0.1.8, 02:20:03, Tunnel0
```

```

172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C    172.16.1.0/30 is directly connected, Ethernet0/0
L    172.16.1.1/32 is directly connected, Ethernet0/0
172.25.0.0/32 is subnetted, 1 subnets
C    172.25.179.254 is directly connected, Loopback0
D    192.168.0.0/18 [90/5248000] via 10.0.1.8, 02:20:03, Tunnel0 <<<< Summary route received from hub1
D    192.168.8.0/21 [90/3968000] via 10.0.1.8, 02:20:14, Tunnel0
192.168.11.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.11.0/24 is directly connected, Loopback1
L    192.168.11.1/32 is directly connected, Loopback1
spoke_1#

```

```
spoke_1#show dmvpn detail
```

```

Legend: Attrb --> S - Static, D - Dynamic, I - Incomplete
        N - NATed, L - Local, X - No Socket
        T1 - Route Installed, T2 - Nexthop-override
        C - CTS Capable
# Ent --> Number of NHRP entries with same NBMA peer
NHS Status: E --> Expecting Replies, R --> Responding, W --> Waiting
UpDn Time --> Up or Down Time for a Tunnel

```

```

=====
Interface Tunnel0 is up/up, Addr. is 10.0.1.11, VRF ""
  Tunnel Src./Dest. addr: 172.16.1.1/MGRE, Tunnel VRF ""
  Protocol/Transport: "multi-GRE/IP", Protect "profile-dmvpn"
  Interface State Control: Disabled
  nhrp event-publisher : Disabled

```

```

IPv4 NHS:
10.0.1.8 RE NBMA Address: 172.18.0.1 priority = 0 cluster = 0
Type:Spoke, Total NBMA Peers (v4/v6): 1

```

# Ent	Peer NBMA Addr	Peer Tunnel Add	State	UpDn Tm	Attrb	Target Network
1	172.18.0.1	10.0.1.8	UP	00:02:31	S	10.0.1.8/32

```
<<<< Tunnel to the regional hub 1
```

```
Crypto Session Details:
```

```

-----
Interface: Tunnel0
Session: [0xF5F94CC8]
  Session ID: 0
  IKEv1 SA: local 172.16.1.1/500 remote 172.18.0.1/500 Active

```

```
<<<<< Crypto session to the regional hub 1
```

```

      Capabilities:D connid:1019 lifetime:23:57:28
Crypto Session Status: UP-ACTIVE
fvrf: (none), Phase1_id: 172.18.0.1
IPSEC FLOW: permit 47 host 172.16.1.1 host 172.18.0.1
  Active SAs: 2, origin: crypto map
  Inbound: #pkts dec'ed 35 drop 0 life (KB/Sec) 4153195/3448
  Outbound: #pkts enc'ed 35 drop 0 life (KB/Sec) 4153195/3448
  Outbound SPI : 0xACACB658, transform : esp-256-aes esp-sha-hmac

```

Socket State: Open

Pending DMVPN Sessions:

spoke_1#

لاخدا نيوكت متي يا، هب ثدحتلا متي يذلا يكي مانيدلا قفنلا ليكشت دعب
NHRP راصتخا

<#root>

```
spoke_1#show ip nhrp
10.0.1.8/32 via 10.0.1.8
  Tunnel0 created 02:24:04, never expire
  Type: static, Flags: used
  NBMA address: 172.18.0.1

10.0.2.18/32 via 10.0.2.18
```

<<<<<<<<<< The new NHRP cache entry for spoke 2 that was learnt

Tunnel0 created 00:01:41, expire 01:58:18

Type: dynamic, Flags: router used nhop rib

NBMA address: 172.16.2.1

```
192.168.11.0/24 via 10.0.1.11
  Tunnel0 created 00:01:26, expire 01:58:33
  Type: dynamic, Flags: router unique local
  NBMA address: 172.16.1.1
  (no-socket)
```

192.168.18.0/24 via 10.0.2.18 <<<<<<<<<< New NHRP cache entry formed for the remote subnet behind sp

Tunnel0 created 00:01:41, expire 01:58:18

Type: dynamic, Flags: router rib

NBMA address: 172.16.2.1

spoke_1#

spoke_1#sh ip route next-hop-override

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
 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,

H - NHRP

, l - LISP
 a - application route
 + - replicated route, % - next hop override

Gateway of last resort is 172.16.1.2 to network 0.0.0.0

S* 0.0.0.0/0 [1/0] via 172.16.1.2
 10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
 D 10.0.0.0/24 [90/5120000] via 10.0.1.8, 02:23:57, Tunnel0
 C 10.0.1.0/24 is directly connected, Tunnel0
 L 10.0.1.11/32 is directly connected, Tunnel0
 D 10.0.2.0/24 [90/6681600] via 10.0.1.8, 02:23:46, Tunnel0
 H 10.0.2.18/32 is directly connected, 00:01:48, Tunnel0

172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
 C 172.16.1.0/30 is directly connected, Ethernet0/0
 L 172.16.1.1/32 is directly connected, Ethernet0/0
 172.25.0.0/32 is subnetted, 1 subnets
 C 172.25.179.254 is directly connected, Loopback0
 D 192.168.0.0/18 [90/5248000] via 10.0.1.8, 02:23:46, Tunnel0
 D 192.168.8.0/21 [90/3968000] via 10.0.1.8, 02:23:57, Tunnel0
 192.168.11.0/24 is variably subnetted, 2 subnets, 2 masks
 C 192.168.11.0/24 is directly connected, Loopback1
 L 192.168.11.1/32 is directly connected, Loopback1
 H 192.168.18.0/24 [250/1] via 10.0.2.18, 00:01:48

spoke_1#

spoke_1#sh dmvpn detail

Legend: Attrb --> S - Static, D - Dynamic, I - Incomplete
 N - NATed, L - Local, X - No Socket
 T1 - Route Installed, T2 - Nexthop-override
 C - CTS Capable
 # Ent --> Number of NHRP entries with same NBMA peer
 NHS Status: E --> Expecting Replies, R --> Responding, W --> Waiting
 UpDn Time --> Up or Down Time for a Tunnel

```
=====
Interface Tunnel0 is up/up, Addr. is 10.0.1.11, VRF ""
  Tunnel Src./Dest. addr: 172.16.1.1/MGRE, Tunnel VRF ""
  Protocol/Transport: "multi-GRE/IP", Protect "profile-dmvpn"
  Interface State Control: Disabled
  nhrp event-publisher : Disabled
```

IPv4 NHS:

10.0.1.8 RE NBMA Address: 172.18.0.1 priority = 0 cluster = 0
 Type:Spoke, Total NBMA Peers (v4/v6): 3

```
# Ent Peer NBMA Addr Peer Tunnel Add State UpDn Tm Attrb Target Network
-----
```

```
1 172.18.0.1          10.0.1.8    UP 00:05:44    S        10.0.1.8/32
2 172.16.2.1         10.0.2.18   UP 00:01:51    DT1      10.0.2.18/32
```

<<<< Entry for spoke2's tunnel

```
172.16.2.1          10.0.2.18   UP 00:01:51    DT1      192.168.18.0/24
```

<<<< Entry for the subnet behind spoke2 that was learnt

```
1 172.16.1.1          10.0.1.11   UP 00:01:37    DLX      192.168.11.0/24
```

<<<< Entry formed for the local subnet

Crypto Session Details:

Interface: Tunnel0

Session: [0xF5F94DC0]

Session ID: 0

IKEv1 SA: local 172.16.1.1/500 remote 172.18.0.1/500 Active

Capabilities:D connid:1019 lifetime:23:54:15

Crypto Session Status: UP-ACTIVE

fvrfr: (none), Phase1_id: 172.18.0.1

IPSEC FLOW: permit 47 host 172.16.1.1 host 172.18.0.1

Active SAs: 2, origin: crypto map

Inbound: #pkts dec'ed 8 drop 0 life (KB/Sec) 4153188/3255

Outbound: #pkts enc'ed 9 drop 0 life (KB/Sec) 4153188/3255

Outbound SPI : 0xACACB658, transform : esp-256-aes esp-sha-hmac

Socket State: Open

Interface: Tunnel0

Session: [0xF5F94CC8]

Session ID: 0

IKEv1 SA: local 172.16.1.1/500 remote 172.16.2.1/500 Active

Capabilities:D connid:1020 lifetime:23:58:08

Crypto Session Status: UP-ACTIVE

fvrfr: (none), Phase1_id: 172.16.2.1

IPSEC FLOW: permit 47 host 172.16.1.1 host 172.16.2.1

Active SAs: 2, origin: crypto map

Inbound: #pkts dec'ed 10 drop 0 life (KB/Sec) 4185320/3488

Outbound: #pkts enc'ed 10 drop 0 life (KB/Sec) 4185318/3488

Outbound SPI : 0xCAD04C8B, transform : esp-256-aes esp-sha-hmac

Socket State: Open

Pending DMVPN Sessions:

هالاع هضرع مت يذلي لرحملا (سبقملا ريغ) NHRP ل تقوؤملا ني زختلا ةركاذ لاخدا بس

هجوملا اذهل ةي لرحملا تاك بشلاب ةصاخلا NHRP ني عت تا لاخدا لىل ةي لرحملا ةم ال عال ريشت
هجوملا بي جتسي ام دنع تا لاخدا ل هذه عاشنا متي. (هجوملا اذه ةطساوب اهت نا ي ص مت تي لتل)
عيجم ل قف نلل IP نا ونع ني زختل هم ادختس متي و تامولعمل هذه عم NHRP لي لحت بل طل اذه
هذه لىل لوصول هجوملا اذه دق اذا. تامولعمل هذه اه ي ل لسرا لىل ال NHRP دق
ةلازا ةلاسر لسري سف، ام بس ل (ةك بشل هذه ةمدخ هنا كم اب دع ي مل) ةي لرحملا ةك بشل
NHRP (IP لىل صافت) "لي لرحملا" لاخدا ي ف ةجر دمل ةديعمل ال NHRP دق عيجم لىل ال NHRP
اهب ةصاخلا NHRP ني عت لوا دج نم تامولعمل هذه حسمب ةديعمل ال دق ال ةبلا طمل

دادعإل IPsec لېغشت دېرن الو اهېلإ جاتحن ال يتل NHRP نېي عت تالخدإل سبقم ىري ال ريفشت

<#root>

```
spoke_1#sh ip nhrp 192.168.11.0 detail
192.168.11.0/24 via 10.0.1.11
  Tunnel0 created 00:01:01, expire 01:58:58
  Type: dynamic, Flags: router unique
```

local

NBMA address: 172.16.1.1

(no-socket)

Requester: 10.0.2.18

Request ID: 2

اهحالصإو ءاطخأل فاشكتسا

اهحالصإو نېوكتل ءاطخأل فاشكتسال اهمادختسا كنكمي يتل تامولعمل مسقلا اذرفوي

debug رماو مادختسا لبق [حيحصتلا رماو لوج ةمهم تامولعم](#) ىلإ عجرا: ةظالم

بېترتلا اذهب تاقب ط 4 يف اھحالصإو DMVPN ءاطخأل فاشكتسا نمضتي

1. قفنل ءياهن ةطقن و NBMA) ءي دامل هي جوتل ةقبط
2. IPsec ريفشت ةقبط
3. GRE نيمضت ةقبط
4. ءي كيماني دل هي جوتل تالوكوتورب ةقبط

ءي لاتل رماوأل لېغشت لصفأل نم، اھحالصإو ءاطخأل فاشكتسا لبق

<#root>

```
!! Enable msec debug and log timestamps
```

```
service timestamps debug datetime msec
service timestamps log datetime msec
```

```
!! To help correlate the debug output with the show command outputs
```

terminal exec prompt timestamp

قفن لة اهن ةطقن وَا (NBMA ة اءام لة هءوت لة ةقبط

صاا ل NBMA ناونع ل لوصول ةحول نم لاصلتال رابءا ل عءطتست تنك اذا ام ققحت بءى . (ءءءام ل ل ع show ip nhrp اءا نم) هءوم ل اب صاا ل NBMA ناونع ل TALK نمو هءوم ل اب اذا DMVPN قفن ل ل نم س ل و ، ةءام ل ةهءاول نم ةرشابم لاصلتال تارابءا ل هءه ءرء نأ ةءروءم ل تاهءوم ل نءب ةءامء نارءء ءو هءوت ل نم ققحت ل ل ءا ءاب تنأف ، ءل ءءء نءم ل ةهءوم ل او .

IPSec رءفشت ةقبط

نءب ISAKMP ب ةصاا ل IPsec و SAs لئاسر نم ققحت ل ل ةءل ل رماوال ل لءءشء ب مقم ل ءءو هءوم ل اب ةصاا ل NBMA نءوانع .

```
show crypto isakmp sa detail
show crypto ipsec sa peer <NBMA-address-peer>
```

اهءالص او IPSec رءفشت ةقبط ءاطءا فاشءءسال اءه ءاطءال ءءصت نءءمء نءءمء :

<#root>

!! Use the conditional debugs to restrict the debug output for a specific peer.

```
debug crypto condition peer ipv4 <NBMA address of the peer>
debug crypto isakmp
debug crypto ipsec
```

NHRP

ةلهم <ناوء> ةمءق لء ، مظءنم لءشءب NHRP لءءءسءءءاب ل لمءءم ل صءش ل ل س رء ءبع ةءءام ل ل ءف اءه نم ققحت ل ل ءنءمءى . IP وَا (لمءءم ل ل ع) 1/3 ل NHRP لءءسءء لءءشء ل ل :

```
show ip nhrp nhs detail
show ip nhrp traffic
```

لاسراب موقوي شذحتلا مت يذلا صخشلا ناك اذا ام ققحتلل هالعأ ةدراوال رماوال مدختسأ ةرصلال نم دودر يلعل لوصحلاو NHRP ليجست تابلط.

يف اهب شذحتلا مت يتلا ةقيرطلل NHRP نييعت لاخدا هيذل عزوملا ناك اذا ام نم ققحتلل رمالا اذه ليغش تب مق، عزوملا يلعل تقوملا NHRP نيزخت ةركاذ:

```
show ip nhrp <spoke-tunnel-ip-address>
```

حيحصت تايلمع مادختسا نكمي، اهالصل او NHRP بةقلعتملا لكاشملا ااطخأ فاشكتسال هذه ااطخال:

```
<#root>
```

```
!! Enable conditional NHRP debugs
```

```
debug nhrp condition peer tunnel <tunnel address of the peer>
```

OR

```
debug nhrp condition peer nbma <nbma address of the peer>
```

```
debug nhrp  
debug nhrp packet
```

ةيكيمانيدلا هيچوتلا تالوكوتورب ةقبط

لمعتسي نوكي لوكوتورب دشحت يكرح لابسح ةقيثواذه تلحأ:

- [اهالصل او EIGRP ااطخأ فاشكتسا](#)
- [اهالصل او OSPF ااطخأ فاشكتسا](#)
- [اهالصل او \(BGP\) ةيدودحلا ةرأبعلا لوكوتورب ااطخأ فاشكتسا](#)

ةلص تاذا تاملعم

- [اعويش رثكألا اهالصل او DMVPN ااطخأ فاشكتسا لولج](#)
- [DMVPN شذح عبتت](#)
- [نسخملا NHRP راصتخا ليديت](#)
- [3 ةلجرملا لىلا Dynamic Multipoint VPN نم ةيناثلا ةلجرملا نم ليچرتلا](#)
- [Cisco تازيم حفصتم \(Cisco Feature Navigator\)](#)

- [تادنت سمل او ینقتلا معدلا - Cisco Systems](#)

ةمچرتل هذه ل و ح

ةلأل تاي نقتل ن م ة و مچ م ادخت ساب دن تسم ل ا اذ ه Cisco ت مچرت
م ل ا ل ا ا ن ا ع مچ م ف ن م دخت س م ل م عد و ت م م م دقت ل ة م ش ب ل و
م ك ة ق ي ق د ن و ك ت ن ل ة ل ا ة مچرت ل ض ف ا ن ا ة ظ ح ا ل م م چ ر ي . ة ص ا خ ل م ه ت غ ل ب
Cisco ي ل خ ت . ف ر ت م م مچرت م ا ه م د ق ي ي ت ل ا ة ي ف ا ر ت ح ا ل ا ة مچرت ل ا م ل ا ح ل ا و ه
ل ا ا م ا د ا د ع و چ ر ل ا ب ي ص و ت و ت ا مچرت ل ا ه ذ ه ة ق د ن ع ا ه ت ي ل و ئ س م Cisco
Systems (ر ف و ت م ط ب ا ر ل ا) ي ل ص ا ل ا ي ز ي ل چ ن ا ل ا دن ت س م ل ا