Configuration d'IPSec avec EIGRP and IPX, à l'aide de la tunnelisation GRE

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Introduction

Les configurations IPSec normales ne peuvent pas transférer de protocoles de routage tels que EIGRP (Enhanced Interior Gateway Routing Protocol) et OSPF (Open Shortest Path First) ou le trafic non IP tel que IPX (Internetwork Packet Exchange), AppleTalk, etc. Ce document explique comment router entre différents réseaux à l'aide d'un protocole de routage et du trafic non IP avec IPSec. Cette technique utilise l'encapsulation de routage générique (GRE) comme méthode pour y parvenir.

Conditions préalables

Conditions requises

Assurez-vous de répondre à ces exigences avant d'essayer cette configuration :

- Assurez-vous que le tunnel fonctionne avant d'appliquer les crypto-cartes.
- La liste d’accès de chiffrement doit avoir GRE comme protocole pour permettre : access-list 101 permit gre host x.x.x.x host y.y.y x.x.x.x = <source_tunnel> y.y.y.y = <destination_tunnel>
- Utilisez des adresses IP de bouclage pour identifier les homologues IKE (Internet Key Exchange) et la source et la destination du tunnel pour améliorer la disponibilité.
- Pour une discussion sur d'éventuels problèmes d'unité de transmission maximale (MTU), référez-vous à Ajuster la MTU IP, TCP MSS et PMTUD sur les systèmes Windows et Sun.

Components Used

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

- Logiciel Cisco IOS® versions 12.1.8 et 12.2.1

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.

Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

Configuration

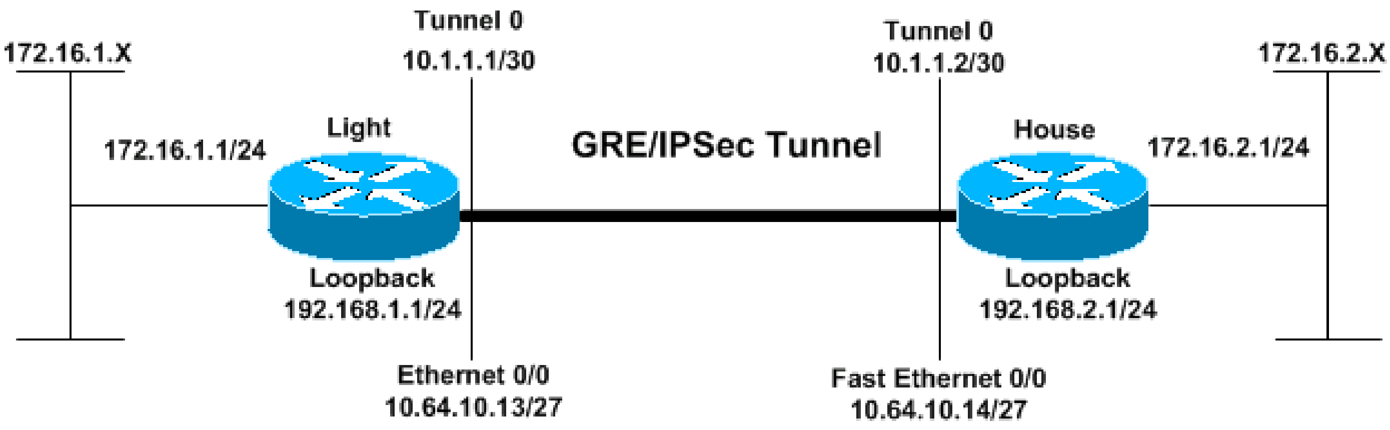
Cette section vous fournit des informations pour configurer les fonctionnalités décrites dans ce document.

Remarque : Pour en savoir plus sur les commandes utilisées dans le présent document, utilisez l'outil de recherche de commandes (clients inscrits seulement).

Remarque sur la configuration IOS : Avec le logiciel Cisco IOS Version 12.2(13)T et les codes ultérieurs (codes de train T plus nombreux, codes de logiciel Cisco IOS Version 12.3 et ultérieure), la crypto-carte IPSec configurée doit uniquement être appliquée à l'interface physique. Il n'est plus nécessaire de l'appliquer sur l'interface de tunnel GRE. La « crypto map » sur l'interface physique et tunnel lorsque vous utilisez le logiciel Cisco IOS Version 12.2.2(13)T et les codes ultérieurs fonctionne toujours. Cependant, il est fortement recommandé de l'appliquer uniquement sur l'interface physique.

Diagramme du réseau

Ce document utilise la configuration réseau indiquée dans le diagramme suivant.



Configurations

- Lumière

- Maison

Lumière

```
Current configuration:
!
version 12.2
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Light
!
logging rate-limit console 10 except errors
!
ip subnet-zero
!
!
no ip finger
!
no ip dhcp-client network-discovery
ipx routing 00e0.b06a.40fc
!
!--- IKE policies. crypto isakmp policy 25
hash md5
authentication pre-share
crypto isakmp key cisco123 address 192.168.2.1
!
!--- IPSec policies. crypto ipsec transform-set WWW esp-
des esp-md5-hmac
mode transport
!
crypto map GRE local-address Loopback0
crypto map GRE 50 ipsec-isakmp
set peer 192.168.2.1
set transform-set WWW
!--- What to encrypt? match address 101
!
call rsvp-sync
!
fax interface-type modem
mta receive maximum-recipients 0
!
interface Loopback0
ip address 192.168.1.1 255.255.255.0
!
interface Tunnel0
ip address 10.1.1.1 255.255.255.252
ip mtu 1440
ipx network CC
tunnel source Loopback0
tunnel destination 192.168.2.1
crypto map GRE
!
interface FastEthernet0/0
ip address 10.64.10.13 255.255.255.224
no ip route-cache
no ip mroute-cache
duplex auto
speed auto
crypto map GRE
```

```
!
interface FastEthernet0/1
ip address 172.16.1.1 255.255.255.0
duplex auto
speed auto
ipx network AA
!
router eigrp 10
network 10.1.1.0 0.0.0.3
network 172.16.1.0 0.0.0.255
network 192.168.1.0
no auto-summary
no eigrp log-neighbor-changes
!
ip kerberos source-interface any
ip classless
ip route 192.168.2.0 255.255.255.0 10.64.10.14
ip http server
!
!--- What to encrypt? access-list 101 permit gre host
192.168.1.1 host 192.168.2.1
!
dial-peer cor custom
!
line con 0
transport input none
line aux 0
line vty 0 4
login
!
end

Light#!
```

Maison

```

Current configuration:
version 12.1
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname House
!
ip subnet-zero
!
ipx routing 00e0.b06a.4114
!
!--- IKE policies. crypto isakmp policy 25
hash md5
authentication pre-share
crypto isakmp key cisco123 address 192.168.1.1
!
!--- IPSec policies. crypto ipsec transform-set WWW esp-
des esp-md5-hmac
mode transport
!
crypto map GRE local-address Loopback0
crypto map GRE 50 ipsec-isakmp
set peer 192.168.1.1
set transform-set WWW
!--- What to encrypt? match address 101
!
```

```
!
interface Loopback0
ip address 192.168.2.1 255.255.255.0
!
interface Tunnel0
ip address 10.1.1.2 255.255.255.252
ip mtu 1440
ipx network CC
tunnel source Loopback0
tunnel destination 192.168.1.1
crypto map GRE
!
interface FastEthernet0/0
ip address 10.64.10.14 255.255.255.224
no ip route-cache
no ip mroute-cache
duplex auto
speed auto
crypto map GRE
!
interface FastEthernet0/1
ip address 172.16.2.1 255.255.255.0
duplex auto
speed auto
ipx network BB
!
interface FastEthernet4/0
no ip address
shutdown
duplex auto
speed auto
!
router eigrp 10
network 10.1.1.0 0.0.0.3
network 172.16.2.0 0.0.0.255
network 192.168.2.0
no auto-summary
no eigrp log-neighbor-changes
!
ip classless
ip route 192.168.1.0 255.255.255.0 10.64.10.13
ip http server
!--- What to encrypt? access-list 101 permit gre host
192.168.2.1 host 192.168.1.1
!
line con 0
line aux 0
line vty 0 4
login
!
end

House#
```

Vérification

Cette section fournit des informations qui vous permettront de vérifier que votre configuration fonctionne correctement.

Certaines commandes **show** sont prises en charge par l'Output Interpreter Tool (clients enregistrés uniquement), qui vous permet de voir une analyse de la sortie de la commande show.

- **show crypto engine connections active** - Affiche les paquets chiffrés et déchiffrés entre homologues IPSec.
- **show crypto isakmp sa** - Affiche les associations de sécurité de la phase 1.
- **show crypto ipsec sa** - Affiche les associations de sécurité de phase 2.
- **show ipx route [network] [default] [detail]** : affiche le contenu de la table de routage IPX.

show Command Output With Tunnels Up

```
Light#show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

Gateway of last resort is not set

     172.16.0.0/24 is subnetted, 2 subnets
C       172.16.1.0 is directly connected, FastEthernet0/1
D       172.16.2.0 [90/297246976] via 10.1.1.2, 00:00:31, Tunnel0
     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.1.1.0/30 is directly connected, Tunnel0
C       10.64.10.0/27 is directly connected, FastEthernet0/0
C    192.168.1.0/24 is directly connected, Loopback0
S    192.168.2.0/24 [1/0] via 10.64.10.14
Light#ping
Protocol [ip]:
Target IP address: 172.16.2.1
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 172.16.1.1
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp, Verbose[none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.2.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms
Light#

House#show ip route
Codes: C - connected, S - static, I - IGRP, 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, E - EGP
       i - IS-IS, 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

Gateway of last resort is not set

     172.16.0.0/24 is subnetted, 2 subnets
D       172.16.1.0 [90/297246976] via 10.1.1.1, 00:00:36, Tunnel0
```

```
C       172.16.2.0 is directly connected, FastEthernet0/1
     10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       10.1.1.0/30 is directly connected, Tunnel0
C       10.64.10.0/27 is directly connected, FastEthernet0/0
S    192.168.1.0/24 [1/0] via 10.64.10.13
C    192.168.2.0/24 is directly connected, Loopback0
House#ping
Protocol [ip]:
Target IP address: 172.16.1.1
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]: y
Source address or interface: 172.16.2.1
Type of service [0]:
Set DF bit in IP header? [no]:
Validate reply data? [no]:
Data pattern [0xABCD]:
Loose, Strict, Record, Timestamp, Verbose[none]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

Light#show ipx route
Codes: C - Connected primary network,    c - Connected secondary network
       S - Static, F - Floating static, L - Local (internal), W - IPXWAN
       R - RIP, E - EIGRP, N - NLSP, X - External, A - Aggregate
       s - seconds, u - uses, U - Per-user static

3 Total IPX routes. Up to 1 parallel paths and 16 hops allowed.

No default route known.

C         AA (NOVELL-ETHER),  Fa0/1
C         CC (TUNNEL),        Tu0
R         BB [151/01] via       CC.00e0.b06a.4114,   17s, Tu0

House#show ipx route
Codes: C - Connected primary network,    c - Connected secondary network
       S - Static, F - Floating static, L - Local (internal), W - IPXWAN
       R - RIP, E - EIGRP, N - NLSP, X - External, A - Aggregate
       s - seconds, u - uses, U - Per-user static

3 Total IPX routes. Up to 1 parallel paths and 16 hops allowed.

No default route known.

C         BB (NOVELL-ETHER),  Fa0/1
C         CC (TUNNEL),        Tu0
R         AA [151/01] via       CC.00e0.b06a.40fc,   59s, Tu0

Light#ping ipx BB.0004.9af2.8261

Type escape sequence to abort.
Sending 5, 100-byte IPX Novell Echoes to BB.0004.9af2.8261, timeout is 2 second:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

House#ping ipx AA.0004.9af2.8181

Type escape sequence to abort.
Sending 5, 100-byte IPX Novell Echoes to AA.0004.9af2.8181, timeout is 2 second:
```

```
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

Light#show crypto isa sa
    dst            src           state        conn-id   slot
192.168.2.1    192.168.1.1    QM_IDLE           1       0
192.168.1.1    192.168.2.1    QM_IDLE           2       0

House#show crypto isa sa
    dst            src           state        conn-id   slot
192.168.1.1    192.168.2.1    QM_IDLE           1       0
192.168.2.1    192.168.1.1    QM_IDLE           2       0


Light#show crypto engine connections active

  ID Interface       IP-Address      State  Algorithm           Encrypt  Decrypt
   1 <none>          <none>          set    HMAC_MD5+DES_56_CB        0        0
   2 <none>          <none>          set    HMAC_MD5+DES_56_CB        0        0
2000 FastEthernet0/0 10.64.10.13     set    HMAC_MD5+DES_56_CB        0      161
2001 FastEthernet0/0 10.64.10.13     set    HMAC_MD5+DES_56_CB      161        0
2002 FastEthernet0/0 10.64.10.13     set    HMAC_MD5+DES_56_CB        0        0
2003 FastEthernet0/0 10.64.10.13     set    HMAC_MD5+DES_56_CB        0        0
2004 FastEthernet0/0 10.64.10.13     set    HMAC_MD5+DES_56_CB        0        0
2005 FastEthernet0/0 10.64.10.13     set    HMAC_MD5+DES_56_CB        0        0

House#show crypto engine connections active

  ID Interface       IP-Address      State  Algorithm           Encrypt  Decrypt
   1 <none>          <none>          set    HMAC_MD5+DES_56_CB        0        0
   2 <none>          <none>          set    HMAC_MD5+DES_56_CB        0        0
2000 FastEthernet0/0 10.64.10.14     set    HMAC_MD5+DES_56_CB        0      159
2001 FastEthernet0/0 10.64.10.14     set    HMAC_MD5+DES_56_CB      159        0
2002 FastEthernet0/0 10.64.10.14     set    HMAC_MD5+DES_56_CB        0        0
2003 FastEthernet0/0 10.64.10.14     set    HMAC_MD5+DES_56_CB        0        0
2004 FastEthernet0/0 10.64.10.14     set    HMAC_MD5+DES_56_CB        0        0
2005 FastEthernet0/0 10.64.10.14     set    HMAC_MD5+DES_56_CB        0        0

House#show crypto ipsec sa detail

interface: Tunnel0
    Crypto map tag: GRE, local addr. 192.168.2.1

   local  ident (addr/mask/prot/port): (192.168.2.1/255.255.255.255/47/0)
   remote ident (addr/mask/prot/port): (192.168.1.1/255.255.255.255/47/0)
   current_peer: 192.168.1.1
     PERMIT, flags={origin_is_acl,transport_parent,}
    #pkts encaps: 192, #pkts encrypt: 192, #pkts digest 192
    #pkts decaps: 190, #pkts decrypt: 190, #pkts verify 190
    #pkts compressed: 0, #pkts decompressed: 0
    #pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress failed: 0
    #pkts no sa (send) 12, #pkts invalid sa (rcv) 0
    #pkts encaps failed (send) 0, #pkts decaps failed (rcv) 0
    #pkts invalid prot (recv) 0, #pkts verify failed: 0
    #pkts invalid identity (recv) 0, #pkts invalid len (rcv) 0
    #pkts replay rollover (send): 0, #pkts replay rollover (rcv) 0
    ##pkts replay failed (rcv): 0
    #pkts internal err (send): 0, #pkts internal err (recv) 0

     local crypto endpt.: 192.168.2.1, remote crypto endpt.: 192.168.1.1
     path mtu 1514, media mtu 1514
     current outbound spi: 1FA721CA

     inbound esp sas:
```

```
     spi: 0xEE52531(249898289)
       transform: esp-des esp-md5-hmac ,
       in use settings ={Transport, }
       slot: 0, conn id: 2000, flow_id: 1, crypto map: GRE
       sa timing: remaining key lifetime (k/sec): (4607961/2797)
       IV size: 8 bytes
       replay detection support: Y
     spi: 0xFEE24F3(267265267)
       transform: esp-des esp-md5-hmac ,
       in use settings ={Transport, }
       slot: 0, conn id: 2002, flow_id: 3, crypto map: GRE
       sa timing: remaining key lifetime (k/sec): (4608000/2826)
       IV size: 8 bytes
       replay detection support: Y
     spi: 0x19240817(421791767)
       transform: esp-des esp-md5-hmac ,
       in use settings ={Transport, }
       slot: 0, conn id: 2004, flow_id: 5, crypto map: GRE
       sa timing: remaining key lifetime (k/sec): (4608000/2759)
       IV size: 8 bytes
       replay detection support: Y

    inbound ah sas:

    inbound pcp sas:

    outbound esp sas:
     spi: 0x1FA721CA(531046858)
       transform: esp-des esp-md5-hmac ,
       in use settings ={Transport, }
       slot: 0, conn id: 2001, flow_id: 2, crypto map: GRE
       sa timing: remaining key lifetime (k/sec): (4607972/2797)
       IV size: 8 bytes
       replay detection support: Y
     spi: 0x12B10EB0(313593520)
       transform: esp-des esp-md5-hmac ,
       in use settings ={Transport, }
       slot: 0, conn id: 2003, flow_id: 4, crypto map: GRE
       sa timing: remaining key lifetime (k/sec): (4608000/2826)
       IV size: 8 bytes
       replay detection support: Y
     spi: 0x1A700242(443548226)
       transform: esp-des esp-md5-hmac ,
       in use settings ={Transport, }
       slot: 0, conn id: 2005, flow_id: 6, crypto map: GRE
       sa timing: remaining key lifetime (k/sec): (4608000/2759)
       IV size: 8 bytes
       replay detection support: Y

    outbound ah sas:

    outbound pcp sas:


  local  ident (addr/mask/prot/port): (192.168.2.1/255.255.255.255/0/0)
  remote ident (addr/mask/prot/port): (192.168.1.1/255.255.255.255/0/0)
  current_peer: 192.168.1.1
    PERMIT, flags={transport_parent,}
   #pkts encaps: 0, #pkts encrypt: 0, #pkts digest 0
   #pkts decaps: 0, #pkts decrypt: 0, #pkts verify 0
   #pkts compressed: 0, #pkts decompressed: 0
   #pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress failed: 0
   #pkts no sa (send) 0, #pkts invalid sa (rcv) 0
   #pkts encaps failed (send) 0, #pkts decaps failed (rcv) 0
```

```
    #pkts invalid prot (recv) 0, #pkts verify failed: 0
    #pkts invalid identity (recv) 0, #pkts invalid len (rcv) 0
    #pkts replay rollover (send): 0, #pkts replay rollover (rcv) 0
    ##pkts replay failed (rcv): 0
    #pkts internal err (send): 0, #pkts internal err (recv) 0

     local crypto endpt.: 192.168.2.1, remote crypto endpt.: 192.168.1.1
     path mtu 1514, media mtu 1514
     current outbound spi: 0

     inbound esp sas:

     inbound ah sas:

     inbound pcp sas:

     outbound esp sas:

     outbound ah sas:

     outbound pcp sas:



interface: FastEthernet0/0
    Crypto map tag: GRE, local addr. 192.168.2.1

   local  ident (addr/mask/prot/port): (192.168.2.1/255.255.255.255/47/0)
   remote ident (addr/mask/prot/port): (192.168.1.1/255.255.255.255/47/0)
   current_peer: 192.168.1.1
     PERMIT, flags={origin_is_acl,transport_parent,}
    #pkts encaps: 193, #pkts encrypt: 193, #pkts digest 193
    #pkts decaps: 192, #pkts decrypt: 192, #pkts verify 192
    #pkts compressed: 0, #pkts decompressed: 0
    #pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress failed: 0
    #pkts no sa (send) 12, #pkts invalid sa (rcv) 0
    #pkts encaps failed (send) 0, #pkts decaps failed (rcv) 0
    #pkts invalid prot (recv) 0, #pkts verify failed: 0
    #pkts invalid identity (recv) 0, #pkts invalid len (rcv) 0
    #pkts replay rollover (send): 0, #pkts replay rollover (rcv) 0
    ##pkts replay failed (rcv): 0
    #pkts internal err (send): 0, #pkts internal err (recv) 0

     local crypto endpt.: 192.168.2.1, remote crypto endpt.: 192.168.1.1
     path mtu 1514, media mtu 1514
     current outbound spi: 1FA721CA

     inbound esp sas:
      spi: 0xEE52531(249898289)
        transform: esp-des esp-md5-hmac ,
        in use settings ={Transport, }
        slot: 0, conn id: 2000, flow_id: 1, crypto map: GRE
        sa timing: remaining key lifetime (k/sec): (4607961/2789)
        IV size: 8 bytes
        replay detection support: Y
      spi: 0xFEE24F3(267265267)
        transform: esp-des esp-md5-hmac ,
        in use settings ={Transport, }
        slot: 0, conn id: 2002, flow_id: 3, crypto map: GRE
        sa timing: remaining key lifetime (k/sec): (4608000/2817)
        IV size: 8 bytes
        replay detection support: Y
      spi: 0x19240817(421791767)
        transform: esp-des esp-md5-hmac ,
     in use settings ={Transport, }
     slot: 0, conn id: 2004, flow_id: 5, crypto map: GRE
     sa timing: remaining key lifetime (k/sec): (4608000/2750)
     IV size: 8 bytes
     replay detection support: Y

  inbound ah sas:

  inbound pcp sas:

  outbound esp sas:
   spi: 0x1FA721CA(531046858)
     transform: esp-des esp-md5-hmac ,
     in use settings ={Transport, }
     slot: 0, conn id: 2001, flow_id: 2, crypto map: GRE
     sa timing: remaining key lifetime (k/sec): (4607972/2789)
     IV size: 8 bytes
     replay detection support: Y
   spi: 0x12B10EB0(313593520)
     transform: esp-des esp-md5-hmac ,
     in use settings ={Transport, }
     slot: 0, conn id: 2003, flow_id: 4, crypto map: GRE
     sa timing: remaining key lifetime (k/sec): (4608000/2817)
     IV size: 8 bytes
     replay detection support: Y
   spi: 0x1A700242(443548226)
     transform: esp-des esp-md5-hmac ,
     in use settings ={Transport, }
     slot: 0, conn id: 2005, flow_id: 6, crypto map: GRE
     sa timing: remaining key lifetime (k/sec): (4608000/2750)
     IV size: 8 bytes
     replay detection support: Y

  outbound ah sas:

  outbound pcp sas:


local  ident (addr/mask/prot/port): (192.168.2.1/255.255.255.255/0/0)
remote ident (addr/mask/prot/port): (192.168.1.1/255.255.255.255/0/0)
current_peer: 192.168.1.1
  PERMIT, flags={transport_parent,}
 #pkts encaps: 0, #pkts encrypt: 0, #pkts digest 0
 #pkts decaps: 0, #pkts decrypt: 0, #pkts verify 0
 #pkts compressed: 0, #pkts decompressed: 0
 #pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress failed: 0
 #pkts no sa (send) 0, #pkts invalid sa (rcv) 0
 #pkts encaps failed (send) 0, #pkts decaps failed (rcv) 0
 #pkts invalid prot (recv) 0, #pkts verify failed: 0
 #pkts invalid identity (recv) 0, #pkts invalid len (rcv) 0
 #pkts replay rollover (send): 0, #pkts replay rollover (rcv) 0
 ##pkts replay failed (rcv): 0
 #pkts internal err (send): 0, #pkts internal err (recv) 0

  local crypto endpt.: 192.168.2.1, remote crypto endpt.: 192.168.1.1
  path mtu 1514, media mtu 1514
  current outbound spi: 0

  inbound esp sas:

  inbound ah sas:

  inbound pcp sas:
     outbound esp sas:

     outbound ah sas:

     outbound pcp sas:
```

Dépannage

Cette section fournit des informations que vous pouvez utiliser pour dépanner votre configuration.

Dépannage des commandes

Certaines commandes **show** sont prises en charge par l'Output Interpreter Tool (clients enregistrés uniquement), qui vous permet de voir une analyse de la sortie de la commande show.

Remarque : Avant d'émettre des commandes **debug**, reportez-vous à Informations importantes sur les commandes de débogage.

- **debug crypto isakmp** - Affiche les erreurs au cours de la phase 1.
- **debug crypto ipsec** - Affiche les erreurs pendant la phase 2.
- **debug crypto engine — Affiche des informations du moteur de chiffrement.**
- **debug ip *your routing protocol*** : affiche des informations sur les transactions de routage de votre protocole de routage.
- **clear crypto connection connection-id *[slot*** *| rsm | vip]* : met fin à une session chiffrée en cours. Les sessions chiffrées se terminent normalement lorsque la session expire. Utilisez la commande **show crypto cisco connections** pour connaître la valeur connection-id.
- **clear crypto isakmp** : efface les associations de sécurité de phase 1.
- **clear crypto sa** : efface les associations de sécurité de phase 2.

Informations connexes

- Page d'assistance IPsec
- Présentation du chiffrement IPSec (IP Security)
- Configuration de la sécurité des réseaux IPSec
- Configuration du protocole IKE (Internet Key Exchange)
- Command Lookup Tool (clients enregistrés uniquement)
- Support technique - Cisco Systems