

Configuración de GRE sobre IPSec entre un router del IOS de Cisco y un concentrador VPN 5000 usando RIP y CVC.

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[Introducción](#)

Esta configuración de muestra describe cómo configurar el Generic Routing Encapsulation (GRE) sobre el IPSec entre un concentrador del Cisco VPN 5000 y un router de Cisco IOS®. La función GRE sobre IPSec se introduce en la versión de software del VPN 5000 Concentrator 6.0(19).

El Routing Information Protocol (RIP) se utiliza como el Dynamic Routing Protocol en esta muestra para rutear el tráfico a través del túnel VPN.

[prerrequisitos](#)

[Requisitos](#)

No hay requisitos específicos para este documento.

[Componentes Utilizados](#)

La información que contiene este documento se basa en las siguientes versiones de software y hardware.

- Cisco IOS Software Release 12.1(5)T7
- Software Release 6.0(19) del VPN 5000 concentrator

La información que contiene este documento se creó a partir de los dispositivos en un ambiente de laboratorio específico. Todos los dispositivos que se utilizan en este documento se pusieron en funcionamiento con una configuración verificada (predeterminada). Si la red está funcionando, asegúrese de haber comprendido el impacto que puede tener cualquier comando.

Convenciones

Para obtener más información sobre las convenciones del documento, consulte [Convenciones de Consejos Técnicos de Cisco](#).

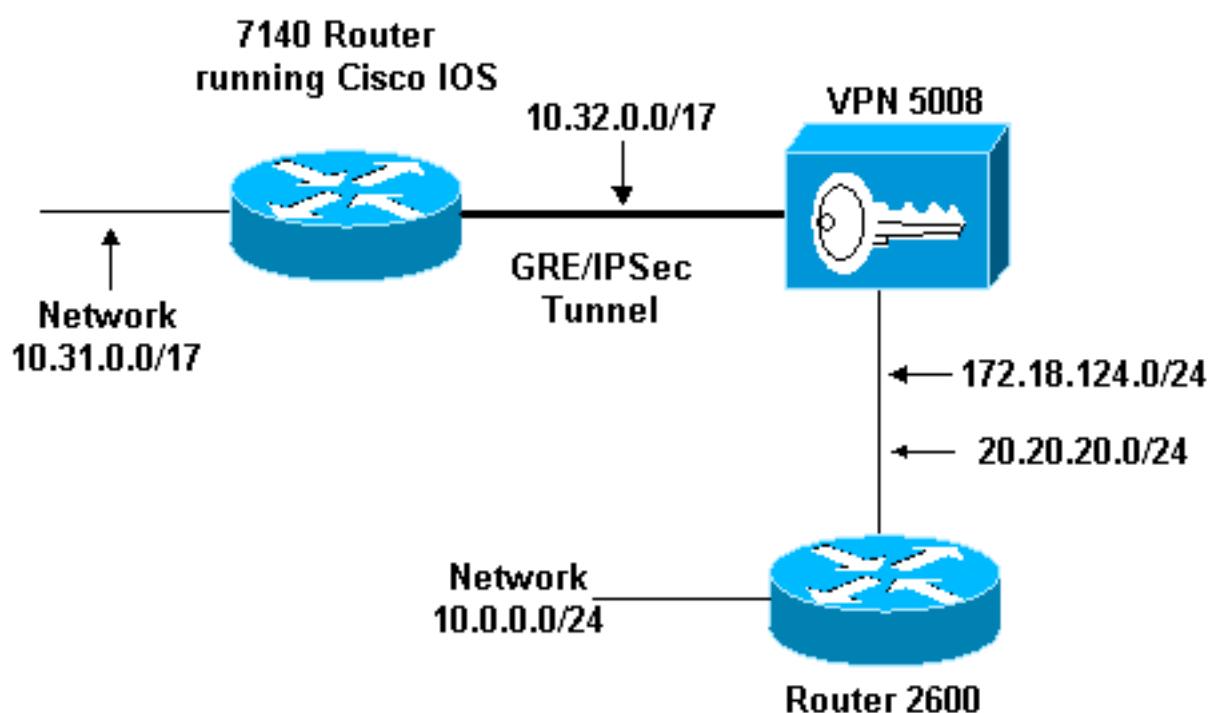
Configurar

En esta sección encontrará la información para configurar las funciones descritas en este documento.

Note: Para obtener información adicional sobre los comandos que se utilizan en este documento, use la Command Lookup Tool (solo para clientes [registrados](#)).

Diagrama de la red

Este documento utiliza la configuración de red que se muestra en el siguiente diagrama.



El GRE sobre IPSec se configura entre el router del Cisco IOS (7140) y el Concentrador Cisco VPN 5008. Detrás de estos dispositivos, las Redes múltiples se hacen publicidad vía el RIP, que se ejecuta dentro del túnel GRE entre 7140 y del VPN 5008.

Las redes detrás del Cisco 7140 son:

- 10.31.0.0/17

Las redes detrás del VPN 5008 son:

- 172.18.124.0.0/24
- 20.20.20.0/24
- 10.0.0.0/24

Configuraciones

Este documento usa las configuraciones detalladas aquí.

- [Router del Cisco IOS](#)
- [Concentrador VPN 5000](#)
- [CVC](#)

Router del Cisco IOS

```
Building configuration...

Current configuration : 1607 bytes
!
version 12.1
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname 03-vpn-7140
!
boot system flash disk1:c7100-ik8s-mz.122-3
logging rate-limit console 10 except errors
enable password <removed>
!
ip subnet-zero
ip cef
!
!
no ip finger
!
! !--- Define phase 1 policy. crypto isakmp policy 10
authentication pre-share
!--- Define the PreShared Key for the Remote peer !---
(5000 ) in this example. crypto isakmp key cisco123
address 10.32.1.161
!
!--- Define Phase 2 policy. !--- Make sure that
Transport Mode is enabled. crypto ipsec transform-set
www esp-des esp-sha-hmac
mode transport
!
!--- Define the crypto map that is later !--- applied on
the outbound interface. crypto map temp 10 ipsec-isakmp
set peer 10.32.1.161
set transform-set www
match address 100
!
call rsvp-sync
!
```

```

!
!
!
!
!
!
controller ISA 5/1
!
!--- Define the GRE tunnel on the router. !--- Tunnel
source is the outbound interface !--- and tunnel
destination is VPN 5000. interface Tunnel0
ip address 10.1.1.2 255.255.255.0
tunnel source FastEthernet0/0
tunnel destination 10.32.1.161
crypto map temp
!
!--- Outbound Interface that is connected to the
Internet. interface FastEthernet0/0
ip address 10.32.1.162 255.255.128.0
duplex auto
speed auto
crypto map temp
!
!!-- Inside interface. interface FastEthernet0/1 ip
address 10.31.100.1 255.255.128.0 no keepalive duplex
auto speed auto ! interface Serial1/0 no ip address
shutdown framing c-bit cablelength 10 dsu bandwidth
44210 ! interface Serial1/1 no ip address shutdown
framing c-bit cablelength 10 dsu bandwidth 44210 ! !---
Define RIP Routing Protocol on the router. !--- This
example shows Version 2 for classless routing. router
rip
version 2
network 10.0.0.0
no auto-summary
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.32.1.1
no ip http server
!
!--- Encryption access-list that is used !--- to encrypt
the GRE packets. access-list 100 permit gre host
10.32.1.162 host 10.32.1.161
!
!
line con 0
exec-timeout 0 0
transport input none
line aux 0
line vty 5 15
!
end

```

Concentrador VPN 5000

```

show configuration
Edited Configuration not Present, using Running
[ IP Ethernet 0:0 ]
SubnetMask = 255.255.255.0
IPAddress = 1.1.1.1

[ IP Ethernet 1:0 ]Mode = Routed

```

```
SubnetMask = 255.255.128.0  
IPAddress = 10.32.1.161
```

```
[ General ]
```

```
VPNGateway = 10.32.1.1  
EnablePassword = <removed>  
Password = <removed>  
EthernetAddress = 00:00:a5:e9:c8:00  
DeviceType = VPN 5002/8 Concentrator  
ConfiguredOn = Timeserver not configured  
ConfiguredFrom = Command Line, from Console
```

```
[ IKE Policy ]
```

```
Protection = SHA_DES_G1
```

```
[ IP Static ]
```

```
0.0.0.0 0.0.0.0 10.32.1.1 1 redistrib=none
```

```
[ Context List ]
```

```
flash://rip.cfg
```

```
[ Logging ]
```

```
Enabled = On  
Level = 7
```

```
Configuration size is 822 out of 65500 bytes.
```

```
VPN5002_8_A5E9C800: Main#
```

CVC

show configuration

```
Edited Configuration not Present, using Running
```

```
[ General ]
```

```
Context = "rip"
```

```
[ IP Ethernet 1:0.1 ]
```

```
VLANID = 124  
Encapsulation = dot1q  
Mode = Routed  
SubnetMask = 255.255.255.0  
IPAddress = 172.18.124.219
```

```
[ IP Static ]
```

```
[ Tunnel Partner VPN 1 ]
```

```
InactivityTimeout = 120  
Transform = esp sha,des  
KeyManage = ReliablePeer = "10.31.0.0/17"  
LocalAccess = "10.5.1.0/24"  
SharedKey = "cisco123"  
Mode = Main  
TunnelType = GREinIPSec  
BindTo = "Ethernet 1:0"  
Partner = 10.32.1.162
```

```
[ IP VPN 1 ]
```

```
RIPIn = On  
RIPOut = On  
RIPVersion = V2
```

```

DirectedBroadcast = Off
Numbered = On
Mode = Routed
SubnetMask = 255.255.255.0
IPAddress = 10.1.1.1

[ IP Ethernet 1:0.2 ]
Mode = Routed
SubnetMask = 255.255.255.0
IPAddress = 20.20.20.20

Configuration size is 1127 out of 65500 bytes.

VPN5002_8_A5E9C800: rip#

```

Verificación

En esta sección encontrará información que puede utilizar para confirmar que su configuración esté funcionando correctamente.

La herramienta [Output Interpreter](#) (sólo para clientes [registrados](#)) permite utilizar algunos comandos “show” y ver un análisis del resultado de estos comandos.

- **ruta de IP de la demostración** — Muestra al estado actual de la tabla de ruteo.
- **show crypto engine connection active** — Muestra el contador de la encriptación de paquetes/del desciframiento por la asociación de seguridad IPsec.
- **muestre IPsec crypto sa** — Muestra todas las asociaciones de seguridad del IPsec actual.
- **show system log buffer** — Muestra la información básica de Syslog.
- **volcado de la traza del vpn** — Muestra la información detallada en los procesos VPN.

```
03-vpn-7140#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 10.32.1.1 to network 0.0.0.0
```

```

20.0.0.0/24 is subnetted, 1 subnets
R 20.20.20.0 [120/1] via 10.1.1.1, 00:00:10, Tunnel0
172.18.0.0/16 is variably subnetted, 2 subnets, 2 masks
R 172.18.124.0/24 [120/1] via 10.1.1.1, 00:00:10, Tunnel0
10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
R 10.0.0.0/24 [120/2] via 10.1.1.1, 00:00:10, Tunnel0
C 10.1.1.0/24 is directly connected, Tunnel0
C 10.31.0.0/17 is directly connected, FastEthernet0/1
C 10.32.0.0/17 is directly connected, FastEthernet0/0
S* 0.0.0.0/0 [1/0] via 10.32.1.1
03-vpn-7140#

```

```
03-vpn-7140#show crypto engine connection active
```

```
ID Interface IP-Address State Algorithm Encrypt Decrypt
```

```
3 FastEthernet0/0 10.32.1.162 set HMAC_SHA+DES_56_CB 0 0
4 FastEthernet0/0 10.32.1.162 set HMAC_SHA+DES_56_CB 0 0
5 FastEthernet0/0 10.32.1.162 set HMAC_SHA+DES_56_CB 0 0
2098 FastEthernet0/0 10.32.1.162 set HMAC_SHA+DES_56_CB 0 1892
2099 FastEthernet0/0 10.32.1.162 set HMAC_SHA+DES_56_CB 11552 0
```

```
03-vpn-7140#show crypto ipsec sa
```

```
interface: FastEthernet0/0
Crypto map tag: temp, local addr. 10.32.1.162

local ident (addr/mask/prot/port): (10.32.1.162/255.255.255.255/0/0)
remote ident (addr/mask/prot/port): (10.32.1.161/255.255.255.255/0/0)
current_peer: 10.32.1.161
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
#send errors 0, #recv errors 0

local crypto endpt.: 10.32.1.162, remote crypto endpt.: 10.32.1.161
path mtu 1500, media mtu 1500
current outbound spi: 0

inbound esp sas:

inbound ah sas:

inbound pcp sas:

outbound esp sas:

outbound ah sas:

outbound pcp sas:

local ident (addr/mask/prot/port): (10.32.1.162/255.255.255.255/47/0)
remote ident (addr/mask/prot/port): (10.32.1.161/255.255.255.255/47/0)
current_peer: 10.32.1.161
PERMIT, flags={origin_is_acl,transport_parent,}
#pkts encaps: 12912, #pkts encrypt: 12912, #pkts digest 12912
#pkts decaps: 2382, #pkts decrypt: 2382, #pkts verify 2382
#pkts compressed: 0, #pkts decompressed: 0
#pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress failed: 0
#send errors 0, #recv errors 0

local crypto endpt.: 10.32.1.162, remote crypto endpt.: 10.32.1.161
path mtu 1500, media mtu 1500
current outbound spi: 101

inbound esp sas:
spi: 0x4624F3AD(1176826797)
transform: esp-des esp-sha-hmac ,
in use settings ={Transport, }
slot: 0, conn id: 2098, flow_id: 69, crypto map: temp

sa timing: remaining key lifetime (k/sec): (1048130/3179)
IV size: 8 bytes
```

replay detection support: Y

inbound ah sas:

inbound pcp sas:

outbound esp sas:

spi: 0x101(257)
transform: esp-des esp-sha-hmac ,
in use settings ={Transport, }
slot: 0, conn id: 2099, flow_id: 70, crypto map: temp
sa timing: remaining key lifetime (k/sec): (1046566/3179)
IV size: 8 bytes
replay detection support: Y

outbound ah sas:

outbound pcp sas:

interface: Tunnel0

Crypto map tag: temp, local addr. 10.32.1.162

local ident (addr/mask/prot/port): (10.32.1.162/255.255.255.255/0/0)
remote ident (addr/mask/prot/port): (10.32.1.161/255.255.255.255/0/0)
current_peer: 10.32.1.161
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
#send errors 0, #recv errors 0

local crypto endpt.: 10.32.1.162, remote crypto endpt.: 10.32.1.161
path mtu 1500, media mtu 1500
current outbound spi: 0

inbound esp sas:

inbound ah sas:

inbound pcp sas:

outbound esp sas:

outbound ah sas:

outbound pcp sas:

local ident (addr/mask/prot/port): (10.32.1.162/255.255.255.255/47/0)
remote ident (addr/mask/prot/port): (10.32.1.161/255.255.255.255/47/0)
current_peer: 10.32.1.161
PERMIT, flags={origin_is_acl,transport_parent,}
#pkts encaps: 13017, #pkts encrypt: 13017, #pkts digest 13017
#pkts decaps: 2410, #pkts decrypt: 2410, #pkts verify 2410
#pkts compressed: 0, #pkts decompressed: 0

#pkts not compressed: 0, #pkts compr. failed: 0, #pkts decompress failed: 0
#send errors 0, #recv errors 0

local crypto endpt.: 10.32.1.162, remote crypto endpt.: 10.32.1.161
path mtu 1500, media mtu 1500

current outbound spi: 101

inbound esp sas:

spi: 0x4624F3AD(1176826797)
transform: esp-des esp-sha-hmac ,
in use settings ={Transport, }
slot: 0, conn id: 2098, flow_id: 69, crypto map: temp
sa timing: remaining key lifetime (k/sec): (1048124/3176)
IV size: 8 bytes
replay detection support: Y

inbound ah sas:

inbound pcp sas:

outbound esp sas:

spi: 0x101(257)
transform: esp-des esp-sha-hmac ,
in use settings ={Transport, }
slot: 0, conn id: 2099, flow_id: 70, crypto map: temp
sa timing: remaining key lifetime (k/sec): (1046566/3176)
IV size: 8 bytes
replay detection support: Y

outbound ah sas:

outbound pcp sas:

Troubleshooting

En esta sección encontrará información que puede utilizar para solucionar problemas de configuración.

Comandos para resolución de problemas

La herramienta [Output Interpreter](#) (sólo para clientes [registrados](#)) permite utilizar algunos comandos “show” y ver un análisis del resultado de estos comandos.

Note: Antes de ejecutar un comando debug, consulte [Información Importante sobre Comandos Debug](#).

- **isakmp del debug crypto** (router del Cisco IOS) — Visualiza la información detallada en la negociación de la fase de intercambio de claves de Internet (IKE) I (modo principal).
- **IPSec del debug crypto** (router del Cisco IOS) — Visualiza la información detallada en la negociación de la fase II IKE (Quick Mode).
- **motor del debug crypto** (router del Cisco IOS) — Hace el debug de la encriptación de paquetes/el desciframiento y el proceso del Diffie-Hellman (DH).
- **RIP del IP del debug** (router del Cisco IOS) — hace el debug del RIP Routing Protocol.

Publique el **comando show ip routing del VPN 5000 concentrator**.

```
VPN5002_8_A5E9C800: rip#show ip routing
```

```
IP Routing Table for rip
Directly Connected Routes:
Destination Mask Ref Uses Type Interface
10.1.1.0 FFFFFFF0 5 STIF VPN0:1
```

```
10.1.1.0 FFFFFFFF 0 STIF Local
10.1.1.1 @FFFFFFF 5 LocalLocal
10.1.1.255 FFFFFFFF 0 STIF Local
20.20.20.0 FFFFFFF0 1352 STIF Ether1:0.2
20.20.20.0 FFFFFFFF 0 STIF Local
20.20.20.20 @FFFFFFF 14 LocalLocal
20.20.20.255 FFFFFFFF 1318 STIF Local
127.0.0.1 FFFFFFFF 0 STIF Local
172.18.124.0 FFFFFFF0 13789 STIF Ether1:0.1
172.18.124.0 FFFFFFFF 0 STIF Local
172.18.124.219 @FFFFFFF 6 LocalLocal
172.18.124.255 FFFFFFFF 13547 STIF Local
224.0.0.5 FFFFFFFF 0 STIF Local
224.0.0.6 FFFFFFFF 0 STIF Local
224.0.0.9 FFFFFFFF 15 STIF Local
255.255.255.255 @FFFFFFF 221 LocalLocal
```

Static Routes:

```
Destination Mask Gateway Metric Ref Uses Type Interface
10.31.0.0 FFFF0000 Interface 1 0 Stat VPN0:1
10.32.1.162 @FFFFFFF 10.32.1.161 2 0 *Stat VPN0:1
```

Dynamic Routes:

```
Src/
Destination Mask Gateway Metric Ref Uses Type TTL Interface
DEFAULT 10.1.1.2 1 293 RIP2 165 VPN0:1
10.0.0.0 FFFFFF00 172.18.124.216 1 0 RIP1 160 Ether1:0.1
10.31.0.0 FFFF8000 10.1.1.2 1 0 RIP2 165 VPN0:1
10.32.0.0 FFFF8000 10.1.1.2 1 0 RIP2 165 VPN0:1
```

Configured IP Routes:

```
Destination Mask Gateway Metric IFnum Flags
10.31.0.0 FFFF0000 Interface 1 VPN 0:1 Redist = none
```

Total Routes in use: 23 Mask -> @Host route Type -> Redist *rip #ospf

VPN5002_8_A5E9C800: rip#show vpn stat ver

```
Current In High Running Script Script Script
Active Negot Water Total Starts OK Error
```

```
-----
Users 0 0 0 0 0 0 0
Partners 1 0 1 1 1 0 0
Total 1 0 1 1 1 0 0
```

Stats VPN0:1

Wrapped 2697

Unwrapped 14439

BadEncap 0

BadAuth 0

BadEncrypt 0

rx IP 14439

rx IPX 0

rx Other 0

tx IP 2697

tx IPX 0

tx Other 0

IKE rekey 0

Input VPN pkts dropped due to no SA: 1

Input VPN pkts dropped due to no free queue entries: 0

IOP slot 1:

Current In High Running Script Script Script
Active Negot Water Total Starts OK Error

Users 0 0 0 0 0 0 0
Partners 0 0 0 0 0 0 0
Total 0 0 0 0 0 0 0

Stats
Wrapped
Unwrapped
BadEncap
BadAuth
BadEncrypt
rx IP
rx IPX
rx Other
tx IP
tx IPX
tx Other

IKE rekey

Input VPN pkts dropped due to no SA: 0

Input VPN pkts dropped due to no free queue entries: 0

IOP slot 2:

Current In High Running Script Script Script
Active Negot Water Total Starts OK Error

Users 0 0 0 0 0 0 0
Partners 0 0 0 0 0 0 0
Total 0 0 0 0 0 0 0

Stats
Wrapped
Unwrapped
BadEncap
BadAuth
BadEncrypt
rx IP
rx IPX
rx Other
tx IP
tx IPX
tx Other
IKE rekey

Input VPN pkts dropped due to no SA: 0

Input VPN pkts dropped due to no free queue entries: 0

IOP slot 3:

Current In High Running Script Script Script
Active Negot Water Total Starts OK Error

Users 0 0 0 0 0 0 0
Partners 0 0 0 0 0 0 0
Total 0 0 0 0 0 0 0

Stats
Wrapped
Unwrapped
BadEncap
BadAuth
BadEncrypt
rx IP
rx IPX
rx Other
tx IP
tx IPX
tx Other
IKE rekey

Input VPN pkts dropped due to no SA: 0

Input VPN pkts dropped due to no free queue entries: 0

[Información Relacionada](#)

- [Página de soporte del Concentradores Cisco VPN de la serie 5000](#)
- [Página de soporte para Cisco VPN 5000 Client](#)
- [Página de Soporte de IPSec \(Protocolo de Seguridad IP\)](#)
- [Soporte Técnico - Cisco Systems](#)