

Ejemplo de Configuración del Método Estático de Protocolo de Tunelización de Capa 2 (Versión 3) y del Método de Hairpinning

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Introducción

Este documento ofrece una configuración de ejemplo para el Protocolo estático de tunelización de capa 2 versión 3 (L2TPv3) y métodos de devolución de llamada (hairpinning).

Esta tabla describe el soporte de modificación de la versión del software Cisco IOS[®] para L2TPv3:

Versión de software del IOS de Cisco	Descripción de Soporte de L2TPv3
12.0(21)S	El soporte inicial del plano de datos para L2TPv3 se introdujo en las plataformas Cisco 7200 Series, Cisco 7500 Series, Cisco 10720 y Cisco 12000 Series.
12.0(23)S	El soporte del plano de control L2TPv3 se introdujo en las plataformas Cisco 7200 Series, Cisco 7500 Series, Cisco 10720 y Cisco 12000 Series.
12,3(2)T	Esta función se integró en Cisco IOS Software Release 12.3(2)T.

Para utilizar la función L2TPv3, debe habilitar Cisco Express Forwarding (CEF). La configuración del submodo Xconnect está bloqueada hasta que se habilite el CEF. En plataformas distribuidas, como la serie 7500 de Cisco, si CEF está deshabilitado cuando se establece una sesión, la sesión se derriba y permanece sin funcionar hasta que se vuelve a habilitar CEF. Utilice el comando `ip cef` o `ip cef distributed` para habilitar CEF.

Se recomienda encarecidamente especificar una dirección IP de origen para configurar una interfaz de loopback. Si no configura una interfaz de loopback, el router selecciona la mejor dirección local disponible, que podría ser cualquier dirección IP configurada en una interfaz de núcleo. Esta configuración puede evitar el establecimiento de un canal de control. La dirección de loopback debe ser accesible desde las redes centrales.

Prerequisites

Requirements

Antes de intentar esta configuración, asegúrese de que conoce lo siguiente:

- [L2TPv3: Layer 2 Tunnel Protocol Version 3](#)

Componentes Utilizados

Este documento no tiene restricciones específicas en cuanto a versiones de software y de hardware.

Convenciones

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

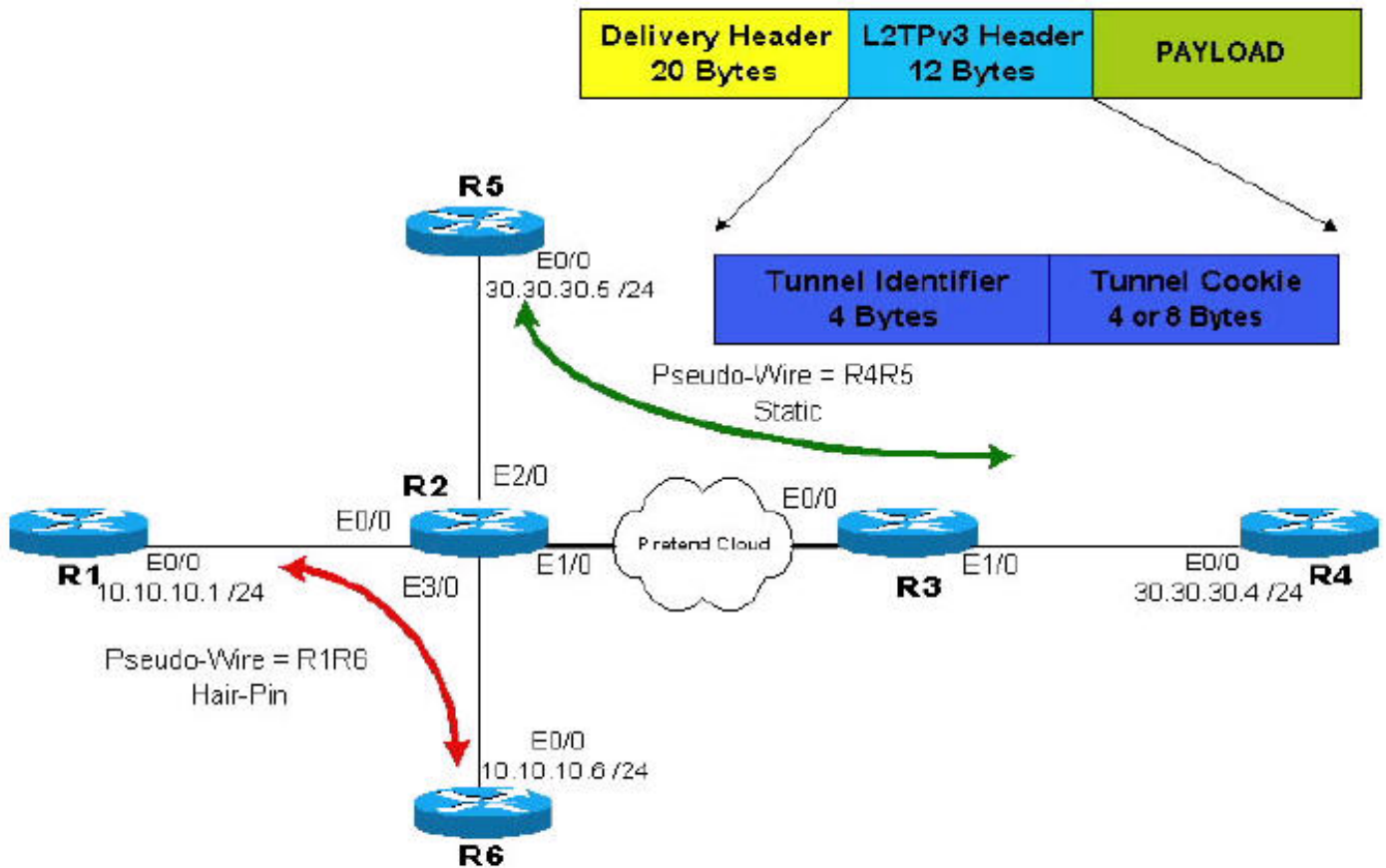
Configurar

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

Nota: Para encontrar información adicional sobre los comandos usados en este documento, utilice la [Command Lookup Tool](#) ([sólo](#) clientes registrados) .

Diagrama de la red

En este documento, se utiliza esta configuración de red:



Nota: El proveedor utiliza los routers R2 y R3. Los routers R1, R4, R5 y R6 son clientes finales. Al utilizar L2TPv3, el router R4 parece tener una conexión directa a R5; esto también se aplica a la conexión entre el router R1 y el router R6.

Configuraciones

En este documento, se utilizan estas configuraciones:

- Pseudo cable estático a través de una nube IP. Parte importante de la configuración se puede encontrar en R2 y R3 donde se configuran dos túneles unidireccionales.
- Pseudo cable de anclaje o conmutación local (de un puerto a otro en el mismo router). La configuración se realiza sólo en R2 y consiste en configurar dos túneles unidireccionales que se dirigen a dos loops de retorno los que se encuentran en el router R2.

```

R2
R2# show running-config
Building configuration...
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname R2
!
!
clock timezone EST 10
ip subnet-zero
ip cef
no ip domain-lookup
l2tp-class R2signal
hello 10

```

```
password 0 cisco
cookie size 8
!
pseudowire-class wireR5R4
encapsulation l2tpv3
protocol l2tpv3 R2signal
ip local interface Loopback0
ip dfbit set
!
pseudowire-class wireR6R1
encapsulation l2tpv3
protocol l2tpv3 R2signal
ip local interface Loopback1
ip dfbit set
!
pseudowire-class wireR1R6
encapsulation l2tpv3
protocol l2tpv3 R2signal
ip local interface Loopback2
ip dfbit set
!
interface Loopback0
description Used by wireR5R4 for Static Connection
ip address 2.2.2.2 255.255.255.255
no ip directed-broadcast
!
interface Loopback1
description Used by wireR6R1 for Hair Pinning Connection
ip address 2.2.2.6 255.255.255.255
no ip directed-broadcast
!
interface Loopback2
description Used by wireR1R6 for Hair Pinning Connection
ip address 2.2.2.1 255.255.255.255
no ip directed-broadcast
!
interface Ethernet0/0
description Connection to R1
no ip address
no ip directed-broadcast
xconnect 2.2.2.6 16 encapsulation l2tpv3 pw-class
wireR1R6
!
interface Ethernet1/0
description Connection to Pretend Cloud.
ip address 20.20.20.2 255.255.255.0
no ip directed-broadcast
no cdp enable
!
interface Ethernet2/0
description Connection to R5
no ip address
no ip directed-broadcast
no cdp enable
xconnect 3.3.3.3 12 encapsulation l2tpv3 pw-class
wireR5R4
!
interface Ethernet3/0
description Connection to R6
no ip address
no ip directed-broadcast
xconnect 2.2.2.1 16 encapsulation l2tpv3 pw-class
wireR6R1
!
```

```
ip classless
ip route 3.3.3.3 255.255.255.255 20.20.20.3
!--- The other end of wireR5R4 loopback (3.3.3.3) must
be !--- reachable from this router. Hair Pinning
loopbacks !--- are reachable—there is no need for
additional routes. !! line con 0 exec-timeout 0 0
privilege level 15 line aux 0 line vty 0 4 login ! end
```

R3

```
R3# show running-config
Building configuration...
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname R3
!
!
clock timezone EST 10
ip subnet-zero
ip cef
!
l2tp-class R3signal
hello 10
password 0 cisco
cookie size 8
!
pseudowire-class wireR4R5
encapsulation l2tpv3
protocol l2tpv3 R3signal
ip local interface Loopback0
ip dfbit set
!
interface Loopback0
description Use by wireR4R5 for static connection
ip address 3.3.3.3 255.255.255.255
no ip directed-broadcast
!
interface Ethernet0/0
ip address 20.20.20.3 255.255.255.0
no ip directed-broadcast
!
interface Ethernet1/0
no ip address
no ip directed-broadcast
no cdp enable
xconnect 2.2.2.2 12 encapsulation l2tpv3 pw-class
wireR4R5
!
ip classless
ip route 2.2.2.2 255.255.255.255 Ethernet0/0
!--- The other end of wireR4R5 loopback (3.3.3.3) must
be !--- reachable from this router. ! line con 0 exec-
timeout 0 0 privilege level 15 line aux 0 line vty 0 4
login ! end
```

Configuración del router final del túnel R1R6 del cliente (pseudo-cable):

R1

```
R1# show running-config
Building configuration...
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname R1
!
!
clock timezone EST 10
ip subnet-zero
no ip domain-lookup
!
interface Ethernet0/0
 ip address 10.10.10.1 255.255.255.0
 no ip directed-broadcast
!
ip classless
!
line con 0
 exec-timeout 0 0
 privilege level 15
line aux 0
line vty 0 4
 login
!
end
```

R6

```
R6# show running-config
Building configuration...
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname R6
!
!
clock timezone EST 10
ip subnet-zero
no ip domain-lookup
!
interface Ethernet0/0
 ip address 10.10.10.6 255.255.255.0
 no ip directed-broadcast
!
ip classless
!
line con 0
 exec-timeout 0 0
 privilege level 15
line aux 0
line vty 0 4
 login
!
end
```

Configuración del router final del túnel R4R5 del cliente (pseudo-cable):

R4

```
R4# show running-config
Building configuration...
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname R4
!
!
ip subnet-zero
!
interface Ethernet0/0
 ip address 30.30.30.4 255.255.255.0
 no ip directed-broadcast
!
router ospf 1
 log-adjacency-changes
 network 30.30.30.0 0.0.0.255 area 0
!
ip classless
!
line con 0
 exec-timeout 0 0
 privilege level 15
line aux 0
line vty 0 4
 login
!
end
```

R5

```
R5# show running-config
Building configuration...
version 12.0
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname R5
!
!
ip subnet-zero
!
interface Ethernet0/0
 ip address 30.30.30.5 255.255.255.0
 no ip directed-broadcast
!
router ospf 1
 log-adjacency-changes
 network 30.30.30.0 0.0.0.255 area 0
!
ip classless
!
line con 0
 exec-timeout 0 0
 privilege level 15
line aux 0
line vty 0 4
 login
```

```
!  
end
```

Verificación

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

```
R4# show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
30.30.30.5	1	FULL/DR	00:00:39	30.30.30.5	Ethernet0/0

```
R5# show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
30.30.30.4	1	FULL/BDR	00:00:38	30.30.30.4	Ethernet0/0

```
R1# show cdp neighbors
```

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
R6	Eth 0/0	158	R	7206VXR	Eth 0/0

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

- **show l2tun tunnel all**: para mostrar el estado actual de una sesión L2TPv3 y mostrar información sobre las sesiones configuradas actualmente, incluidos los nombres de host L2TP locales y remotos, los recuentos de paquetes agregados y los canales de control L2TP, utilice el comando **show l2tun tunnel all** en el modo EXEC.

```
R2# show l2tun tunnel all
```

```
Tunnel Information Total tunnels 3 sessions 3
```

```
Tunnel id 54217 is up, remote id is 44186, 1 active sessions  
Tunnel state is established, time since change 00:12:07  
Tunnel transport is IP (115)  
Remote tunnel name is R2  
Internet Address 2.2.2.6, port 0  
Local tunnel name is R2  
Internet Address 2.2.2.1, port 0  
Tunnel domain is  
VPDN group for tunnel is -  
L2TP class for tunnel is R2signal  
88 packets sent, 87 received  
10086 bytes sent, 11092 received  
Control Ns 76, Nr 74  
Local RWS 1024 (default), Remote RWS 1024 (max)  
Tunnel PMTU checking disabled  
Retransmission time 1, max 1 seconds  
Unsent queuesize 0, max 0  
Resend queuesize 0, max 2  
Total resends 0, ZLB ACKs sent 72  
Current nosession queue check 0 of 5  
Retransmit time distribution: 0 0 0 0 0 0 0 0 0  
Sessions disconnected due to lack of resources 0
```

```
Tunnel id 44186 is up, remote id is 54217, 1 active sessions  
Tunnel state is established, time since change 00:12:08  
Tunnel transport is IP (115)
```


Remote tunnel name is R2
Internet Address 2.2.2.1, port 0
Local tunnel name is R2
Internet Address 2.2.2.6, port 0
Tunnel domain is
VPDN group for tunnel is -
L2TP class for tunnel is R2signal
87 packets sent, 88 received
11092 bytes sent, 10086 received
Control Ns 74, Nr 76
Local RWS 1024 (default), Remote RWS 1024 (max)
Tunnel PMTU checking disabled
Retransmission time 1, max 1 seconds
Unsent queuesize 0, max 0
Resend queuesize 0, max 1
Total resends 0, ZLB ACKs sent 74
Current nosession queue check 0 of 5
Retransmit time distribution: 0 0 0 0 0 0 0 0 0
Sessions disconnected due to lack of resources 0

Tunnel id 24124 is up, remote id is 48735, 1 active sessions
Tunnel state is established, time since change 00:11:00
Tunnel transport is IP (115)
Remote tunnel name is R3
Internet Address 3.3.3.3, port 0
Local tunnel name is R2
Internet Address 2.2.2.2, port 0
Tunnel domain is
VPDN group for tunnel is -
L2TP class for tunnel is R2signal
155 packets sent, 158 received
15230 bytes sent, 17586 received
Control Ns 69, Nr 67
Local RWS 1024 (default), Remote RWS 1024 (max)
Tunnel PMTU checking disabled
Retransmission time 1, max 1 seconds
Unsent queuesize 0, max 0
Resend queuesize 0, max 2
Total resends 1, ZLB ACKs sent 65
Current nosession queue check 0 of 5
Retransmit time distribution: 0 0 1 0 0 0 0 0 0
Sessions disconnected due to lack of resources 0

R3# **show l2tun tunnel all**

Tunnel Information Total tunnels 1 sessions 1

Tunnel id 48735 is up, remote id is 24124, 1 active sessions
Tunnel state is established, time since change 00:12:36
Tunnel transport is IP (115)
Remote tunnel name is R2
Internet Address 2.2.2.2, port 0
Local tunnel name is R3
Internet Address 3.3.3.3, port 0
Tunnel domain is
VPDN group for tunnel is -
L2TP class for tunnel is R3signal
180 packets sent, 176 received
19766 bytes sent, 17316 received
Control Ns 77, Nr 79
Local RWS 1024 (default), Remote RWS 1024 (max)
Tunnel PMTU checking disabled
Retransmission time 1, max 1 seconds
Unsent queuesize 0, max 0
Resend queuesize 0, max 1

Total resends 1, ZLB ACKs sent 78
Current nosession queue check 0 of 5
Retransmit time distribution: 0 0 1 0 0 0 0 0 0
Sessions disconnected due to lack of resources 0

- **show l2tun session all**: para mostrar el estado actual de una sesión de Capa 2 y mostrar información de protocolo sobre un canal de control L2TPv3, utilice el comando **show l2tun session all** en el modo EXEC.

R2# **show l2tun session all**

```
Session Information Total tunnels 3 sessions 3
Session id 19996 is up, tunnel id 54217
  Call serial number is 1492400000
  Remote tunnel name is R2
  Internet address is 2.2.2.6
  Session is L2TP signalled
  Session state is established, time since change 00:15:37
  112 Packets sent, 111 received
  12309 Bytes sent, 13312 received
  Receive packets dropped:
    out-of-order: 0
    total: 0
  Send packets dropped:
    exceeded session MTU: 0
    total: 0
  Session vcid is 16
  Session Layer 2 circuit, type is Ethernet, name is Ethernet0/0
  Circuit state is UP
  Remote session id is 19999, remote tunnel id 44186
  DF bit on, ToS reflect disabled, ToS value 0, TTL value 255
  Session cookie information:
  local cookie, size 8 bytes, value 6E 47 8C 4A BA BF 7E A4
  remote cookie, size 8 bytes, value 7F 9F 65 C4 C7 5B 57 FF
  FS cached header information:
  encaps size = 32 bytes
  00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000

  Sequencing is off
Session id 19999 is up, tunnel id 44186
  Call serial number is 1492400000
  Remote tunnel name is R2
  Internet address is 2.2.2.1
  Session is L2TP signalled
  Session state is established, time since change 00:15:38
  111 Packets sent, 112 received
  13312 Bytes sent, 12309 received
  Receive packets dropped:
    out-of-order: 0
    total: 0
  Send packets dropped:
    exceeded session MTU: 0
    total: 0
  Session vcid is 16
  Session Layer 2 circuit, type is Ethernet, name is Ethernet3/0
  Circuit state is UP
  Remote session id is 19996, remote tunnel id 54217
  DF bit on, ToS reflect disabled, ToS value 0, TTL value 255
  Session cookie information:
  local cookie, size 8 bytes, value 7F 9F 65 C4 C7 5B 57 FF
  remote cookie, size 8 bytes, value 6E 47 8C 4A BA BF 7E A4
  FS cached header information:
  encaps size = 32 bytes
  00000000 00000000 00000000 00000000
  00000000 00000000 00000000 00000000
```

```
Sequencing is off
Session id 20005 is up, tunnel id 24124
Call serial number is 1492400002
Remote tunnel name is R3
Internet address is 3.3.3.3
Session is L2TP signalled
Session state is established, time since change 00:14:29
200 Packets sent, 204 received
19650 Bytes sent, 22100 received
Receive packets dropped:
  out-of-order: 0
  total: 0
Send packets dropped:
  exceeded session MTU: 0
  total: 0
Session vcid is 12
Session Layer 2 circuit, type is Ethernet, name is Ethernet2/0
Circuit state is UP
Remote session id is 17834, remote tunnel id 48735
DF bit on, ToS reflect disabled, ToS value 0, TTL value 255
Session cookie information:
local cookie, size 8 bytes, value 22 09 F1 E9 BC 8C 00 94
remote cookie, size 8 bytes, value 39 DD CB 00 9C 4B 1C 8C
FS cached header information:
encap size = 32 bytes
00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000

Sequencing is off
```

R3# **show l2tun session all**

```
Session Information Total tunnels 1 sessions 1
Session id 17834 is up, tunnel id 48735
Call serial number is 1492400002
Remote tunnel name is R2
Internet address is 2.2.2.2
Session is L2TP signalled
Session state is established, time since change 00:23:53
327 Packets sent, 322 received
33758 Bytes sent, 31248 received
Receive packets dropped:
  out-of-order: 0
  total: 0
Send packets dropped:
  exceeded session MTU: 0
  total: 0
Session vcid is 12
Session Layer 2 circuit, type is Ethernet, name is Ethernet1/0
Circuit state is UP
Remote session id is 20005, remote tunnel id 24124
DF bit on, ToS reflect disabled, ToS value 0, TTL value 255
Session cookie information:
local cookie, size 8 bytes, value 39 DD CB 00 9C 4B 1C 8C
remote cookie, size 8 bytes, value 22 09 F1 E9 BC 8C 00 94
FS cached header information:
encap size = 32 bytes
00000000 00000000 00000000 00000000
00000000 00000000 00000000 00000000

Sequencing is off
```

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

Se puede utilizar el Juego de herramientas para errores de programación (sólo clientes registrados) para obtener más información sobre errores de programación relacionados a las características de L2TPv3:

- [CSCdz01467](#) (sólo clientes [registrados](#)) —Resuelto (R) L2TPv3: Contador de paquetes de túnel, muestra un conteo inexacto.
- [CSCeb56061](#) (sólo clientes [registrados](#)) —Resolved (R) L2TPv3: L2TPv3oETH genera túneles zombi.
- [CSCeb35497](#) (sólo clientes [registrados](#)) —Secuencia resuelta (R) L2TPv3: Tx Seqnum no se ajusta a 1 después de 16777215.
- [CSCdz48481](#) (sólo clientes [registrados](#)) —La configuración de hairpinning resuelto (R) L2TPv3 ya no es compatible.
- [CSCec00463](#) (sólo clientes [registrados](#)) —Resolved (R) L2TPv3: Falla de descap del modo de puerto Ethernet Gig
- [CSCec44356](#) (sólo clientes [registrados](#)) —Resuelto (R) C10720: La coincidencia 802.1P en L2TPv3 hairpinning está rota.

[Información Relacionada](#)

- [Página de Soporte de IP Routed Protocols](#)
- [Página de Soporte de IP Routing](#)
- [Soporte Técnico - Cisco Systems](#)