

# Protocolo Layer 2 Tunneling Protocol (método estático y método de devolución de llamada (hairpinning) ejemplo de configuración de la versión 3)

## Contenido

[Introducción](#)

[prerrequisitos](#)

[Requisitos](#)

[Componentes Utilizados](#)

[Convenciones](#)

[Configurar](#)

[Diagrama de la red](#)

[Configuraciones](#)

[Verificación](#)

[Troubleshooting](#)

[Información Relacionada](#)

## 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 la modificación de la versión del Cisco IOS ® Software para el L2TPv3:

<b>Versión de software del IOS de Cisco</b>	<b>Descripción del soporte del L2TPv3</b>
12.0(21)S	El soporte inicial del avión de los datos para el L2TPv3 fue introducido en las Plataformas de las Cisco 7200 Series, de las Cisco 7500 Series, del Cisco 10720, y de las Cisco 12000 Series.
12.0(23)S	El soporte del avión del control del L2TPv3 fue introducido en las Plataformas de las Cisco 7200 Series, de las Cisco 7500 Series, del Cisco 10720, y de las Cisco 12000

	Series.
12,3(2)T	Esta característica era integrada en el 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** de habilitar el CEF.

Especificar una dirección IP de origen para configurar un Loopback Interface se recomienda altamente. Si usted no configura un Loopback Interface, el router selecciona a la mejor dirección local disponible, que podría ser cualquier dirección IP configurada en una interfaz del memoria-revestimiento. Esta configuración puede evitar el establecimiento de un canal de control. El Loopback Address debe ser accesible de las redes del núcleo.

## [prerrequisitos](#)

### [Requisitos](#)

Antes de intentar esta configuración, asegúrese de que usted está bien informado de:

- [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](#).

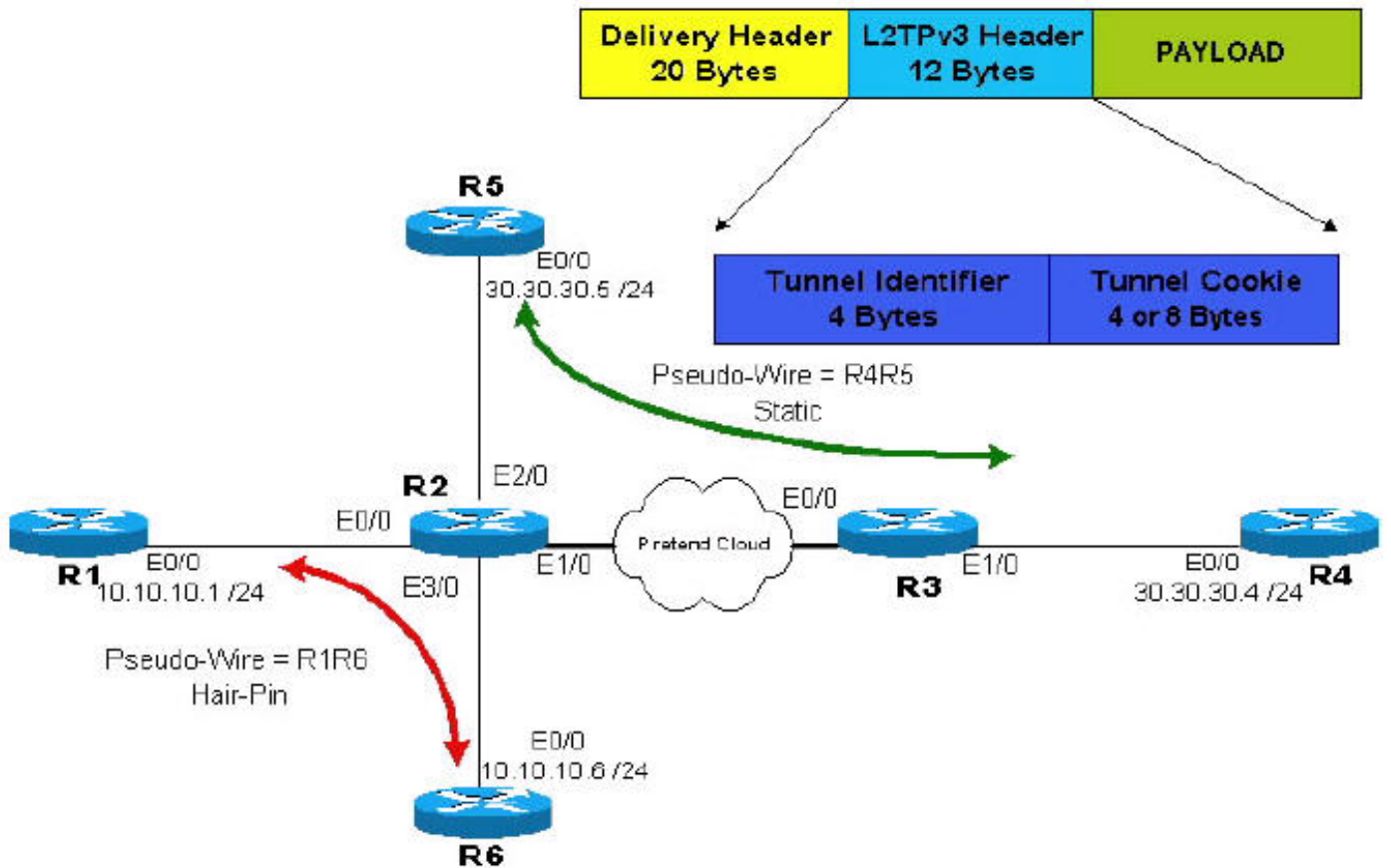
## [Configurar](#)

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

**Nota:** Para 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](#)

En este documento, se utiliza esta configuración de red:



**Nota:** El proveedor utiliza los routers R2 y R3. El r1 del Routers, el R4, el R5, y el R6 son clientes finales. Usando el L2TPv3, el router R4 aparece tener una conexión directa al R5; esto es también verdad para la conexión entre el r1 del router al router R6.

## Configuraciones

En este documento, se utilizan estas configuraciones:

- Seudo alambre 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.
- Seudo alambre o Local Switching de la horquilla (a partir de un puerto a otro puerto 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 del final del túnel del cliente R1R6 (seudo alambre):

### 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 del final del túnel del cliente R4R5 (seudo alambre):

### 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.

- **muestre el túnel todo del l2tun** — Para visualizar al estado actual de una sesión y de un mostrar información del L2TPv3 sobre las sesiones actualmente configuradas, incluyendo los nombres del host locales y remotos L2TP, las cuentas de paquetes globales, y los canales de control L2TP, utilizan 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 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

```

- **muestre la sesión toda del l2tun** — Para visualizar al estado actual de una sesión de la capa 2 y visualizar la información sobre protocolo sobre un canal de control del 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: encaps 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: encaps size = 32 bytes 00000000 00000000 00000000 00000000 00000000 00000000

```

## Troubleshooting

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 \(clientes registrados solamente\)](#) — (r) L2TPv3 resuelto: Contador del paquete del túnel, cuenta inexacta de las visualizaciones.
- [CSCeb56061 \(clientes registrados solamente\)](#) — (r) L2TPv3 resuelto: L2TPv3oETH genera los túneles del zombi.
- [CSCeb35497 \(clientes registrados solamente\)](#) — (r) secuencia resuelta del L2TPv3: El tx Seqnum no envuelve a 1 después de 16777215.
- [CSCdz48481 \(clientes registrados solamente\)](#) — (r) el L2TPv3 resuelto configuración de devolución de llamada (hairpinning) se soporta no más.
- [CSCec00463 \(clientes registrados solamente\)](#) — (r) L2TPv3 resuelto: Gig Ethernet error del decap del modo de puerto
- [CSCec44356 \(clientes registrados solamente\)](#) — (r) C10720 resuelto: La coincidencia 802.1P en el hairpinning del L2TPv3 está quebrada.

## Información Relacionada

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