

Método estático do protocolo Layer 2 Tunneling Protocol (versão 3) e exemplo de configuração do método hairpinning

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[Introdução](#)

Este documento oferece um exemplo de configuração dos métodos de estática e hairpinning da versão 3 do Protocolo de túnel da camada 2 (L2TPv3).

Esta tabela descreve o apoio da alteração da liberação do Cisco IOS ® Software para o L2TPv3:

Versão do Cisco IOS Software	Descrição do apoio do L2TPv3
12.0(21)S	O apoio inicial do plano dos dados para o L2TPv3 foi introduzido nas Plataformas do Cisco 7200 Series, do Cisco 7500 Series, do Cisco 10720, e do Cisco 12000 Series.
12.0(23)S	O apoio do plano do controle do L2TPv3 foi introduzido nas Plataformas do Cisco 7200 Series, do Cisco 7500 Series, do Cisco 10720, e do Cisco 12000 Series.
12.3(2)T	Esta característica foi integrada no Cisco IOS Software Release 12.3(2)T.

É necessário habilitar o CEF (Cisco Express Forwarding) para usar o recurso L2TPv3. O submodo de configuração Xconnect fica bloqueado até que o CEF seja habilitado. Em plataformas distribuídas, como o Cisco 7500 Series, se o CEF for desabilitado enquanto uma sessão é

estabelecida, a sessão será desativada e permanecerá desativada até que o CEF seja reabilitado. Use o **comando ip cef ou ip cef distributed** permitir o CEF.

Especificar um endereço IP de origem para configurar uma interface de loopback é altamente recomendado. Se você não configura uma interface de loopback, o roteador seleciona o melhor endereço local disponível, que poderia ser todo o endereço IP de Um ou Mais Servidores Cisco ICM NT configurado em uma relação do núcleo-revestimento. Essa configuração pode impedir o estabelecimento de um canal de controle. O endereço de loopback deve ser alcançável das redes central.

Pré-requisitos

Requisitos

Antes de tentar esta configuração, assegure-se de que você esteja conhecedor de:

- [L2TPv3: Versão 3 do protocolo de túnel da camada 2](#)

Componentes Utilizados

Este documento não se restringe a versões de software e hardware específicas.

Convenções

Para obter mais informações sobre convenções de documento, consulte as [Convenções de dicas técnicas Cisco](#).

Configurar

Nesta seção, você encontrará informações para configurar os recursos descritos neste documento.

Nota: Para localizar informações adicionais sobre os comandos usados neste documento, utilize a Ferramenta Command Lookup (somente clientes [registrados](#)).

Diagrama de Rede

Este documento utiliza a seguinte configuração de rede:

Nota: Os roteadores R2 e R3 são usados pelo provedor. O r1 do Roteadores, o R4, o R5, e o R6 são clientes finais. Usando o L2TPv3, o roteador R4 parece ter uma conexão direta ao R5; isto é igualmente verdadeiro para a conexão entre o r1 do roteador ao roteador R6.

Configurações

Este documento utiliza as seguintes configurações:

- Fiação pseudo estático através de uma nuvem IP. Uma parte relevante da configuração pode

ser encontrada em R2 e R3, onde estão configurados dois túneis unidirecionais.

- Fiação pseudo ou switching local do gancho de cabelo (de uma porta a uma outra porta no mesmo roteador). A configuração é feita apenas em R2 e consiste na configuração de dois túneis unidirecionais apontando para dois loopbacks, que estão ambos no roteador 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
```

Configuração de roteador do fim do túnel do cliente R1R6 (fiação pseudo):

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
```

Configuração de roteador do fim do túnel do cliente R4R5 (fiação pseudo):

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
```

[Verificar](#)

Esta seção fornece informações que você pode usar para confirmar se sua configuração está funcionando adequadamente.

```
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
```

A [Output Interpreter Tool \(somente clientes registrados\)](#) oferece suporte a determinados comandos show, o que permite exibir uma análise da saída do comando show.

- **mostre o túnel todo do l2tun** — Para indicar o estado atual de uma sessão e de um Exibir informação do L2TPv3 sobre sessões atualmente configuradas, incluindo nomes de host locais e remotos L2TP, os contagens de pacote de informação agregados, e os canais de controle L2TP, usam o **comando show l2tun tunnel all no 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
```
- **mostre a sessão toda do l2tun** — Para indicar o estado atual de uma sessão da camada 2 e indicar a informação de protocolo sobre um canal de controle do L2TPv3, use o **comando show l2tun session all no 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 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 00000000 00000000 Sequencing is off
```

Troubleshooting

Esta seção fornece informações que podem ser usadas para o troubleshooting da sua configuração.

[É possível utilizar o Bug Tool Kit \(apenas clientes registrados\) para obter mais informações sobre esses bugs relacionados aos recursos do L2TPv3:](#)

- [CSCdz01467 \(clientes registrados somente\)](#) — Resolvido (R) L2TPv3: Contador do pacote de túnel, contagem impreciso dos indicadores.
- [CSCeb56061 \(clientes registrados somente\)](#) — Resolvido (R) L2TPv3: L2TPv3oETH gerencie túneis do zombi.
- [CSCeb35497 \(clientes registrados somente\)](#) — Resolvido (R) arranjar em sequência do L2TPv3: Tx Seqnum não envolve a 1 após 16777215.
- [CSCdz48481 \(clientes registrados somente\)](#) — Resolvido (R) a configuração de grampo do L2TPv3 é apoiada já não.
- [CSCec00463 \(clientes registrados somente\)](#) — Resolvido (R) L2TPv3: Falha do decap do modo de porta dos Ethernet Gig
- [CSCec44356 \(clientes registrados somente\)](#) — Resolvido (R) C10720: O fósforo 802.1P no hairpinning do L2TPv3 é quebrado.

Informações Relacionadas

- [Página de suporte dos protocolos roteados de IP](#)
- [Página de Suporte do IP Routing](#)
- [Suporte Técnico - Cisco Systems](#)