

第2层隧道协议(版本3)静态方法和发夹方法配置示例

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简介

本文为第2层隧道协议版本3 (L2TPv3)静态和发夹方法提供一配置示例。

此表描述L2TPv3的Cisco IOS软件版本修改支持：

Cisco IOS 软件版本	L2TPv3支持说明
12.0(21)S	初始数据L2TPv3的飞机支持在Cisco 7200系列， Cisco 7500系列， Cisco 10720和Cisco 12000系列平台介绍。
12.0(23)S	L2TPv3控制层面支持在Cisco 7200系列， Cisco 7500系列， Cisco 10720和Cisco 12000系列平台介绍。
12.3(2)T	此功能集成到Cisco IOS软件版本12.3(2)T。

您必须使思科快速转发(CEF)使用L2TPv3功能。Xconnect配置从属方式阻塞，直到CEF启用。在分布式平台上，例如Cisco 7500系列，如果CEF禁用，当会话建立时，会话被切断并且保持下来，直到CEF重新授权给。请使用**ip cef** or **ip cef distributed**命令启用CEF。

指定源IP地址配置回环接口是高度推荐的。如果不配置回环接口，路由器选择最好的可用的本地地址，可能是在一个面向内核的接口配置的所有IP地址。此配置可能防止控制通道的建立。环回地址一定是可及的从核心网络。

先决条件

要求

在尝试此配置前，请保证您对熟悉：

- [L2TPv3 : Layer2隧道协议版本3](#)

使用的组件

本文档不限于特定的软件和硬件版本。

规则

有关文档规则的详细信息，请参阅 [Cisco 技术提示规则](#)。

配置

本部分提供有关如何配置本文档所述功能的信息。

注意：要查找本文档所用命令的其他信息，请使用[命令查找工具](#)（[仅限注册用户](#)）。

网络图

本文档使用以下网络设置：

注意：供应商使用路由器R2和R3。路由器R1、R4、R5和R6是最终用户。通过使用L2TPv3，路由器R4看上去有对R5的直接连接;这也是可靠对于路由器R1之间的连接对路由器R6。

配置

本文档使用以下配置：

- 静态pseudo-wire通过IP网云。配置的相关部分可以在两个单向隧道配置的R2和R3找到。
- 发夹pseudo-wire或本地交换(从另一个端口的一个端口同一路由器的)。配置在R2仅被执行并且包括配置指向两环回的两个单向隧道，是两个在路由器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

```

客户R1R6通道(pseudo-wire)末端路由器配置：

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
```

客户R4R5通道(pseudo-wire)末端路由器配置：

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
```

验证

本部分所提供的信息可用于确认您的配置是否正常工作。

```
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
```

[命令输出解释程序工具](#) ([仅限注册用户](#)) 支持某些 **show** 命令，使用此工具可以查看对 **show** 命令输出的分析。

- **显示全I2tun的通道显示L2TPv3会话的当前状态，并且显示关于当前配置的会话的信息，包括本地和远程L2TP主机名，聚集数据包计数和L2TP控制通道，在EXEC模式使用show I2tun tunnel all命令。**
R2# show I2tun 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 queue size 0, max 0 Resend queue size 0, max 2 Total resends 0, ZLB ACKs sent 72 Current no session 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 queue size 0, max 0 Resend queue size 0, max 1 Total resends 0, ZLB ACKs sent 74 Current no session 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
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 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 Sessions disconnected due to lack of resources 0
```

- **显示全l2tun的会话显示Layer2会话的当前状态，并且显示关于L2TPv3控制通道的协议信息，请使用show l2tun session all命令在EXEC模式。** 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 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 Sequencing is off
```

故障排除

本部分提供的信息可用于对配置进行故障排除。

您能使用[Bug工具工具箱\(仅限注册用户\)](#)关于这些与L2TPv3功能相关的Bug的更多信息：

- [CSCdz01467 \(仅限注册用户\)](#) —解决的(r) L2TPv3 : 隧道信息包计数器，显示不正确的计数。
- [CSCeb56061 \(仅限注册用户\)](#) —解决的(r) L2TPv3 : L2TPv3oETH生成僵死通道。
- [CSCeb35497 \(仅限注册用户\)](#) —一定序的解决的(r) L2TPv3 : Tx Seqnum不包裹到1在16777215以后。
- [CSCdz48481 \(仅限注册用户\)](#) —不再支持解决的(r) L2TPv3发夹配置。
- [CSCec00463 \(仅限注册用户\)](#) —解决的(r) L2TPv3 : Gig以太网端口模式decap失败
- [CSCec44356 \(仅限注册用户\)](#) —解决的(r) C10720 : 在L2TPv3发夹的匹配802.1P是残破的。

相关信息

- [IP 路由协议支持页](#)
- [IP 路由支持页](#)
- [技术支持 - Cisco Systems](#)