配置 L2TP 多跳以实现从 NAS 到 LNS 的多次跳转

目录

简介

多跳虚拟专用拨号网络(VPDN)允许您配置在途中的几跳从L2TP接入集中器(LAC)到L2TP网络服务器(LNS)。支持最多四跳。通道在每跳(LNS)终止并且被重新发动对下一跳目的地。此进程允许隧道交换。多次跳变可以用于在ISP之间提供一批发接入虚拟专用网络(VPN)服务。

此方案支持两个第二层转发和Layer2隧道协议(L2TP)。然而，因为L2TP变为工业标准，本文着重L2TP。

先决条件

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

要求

本文档没有任何特定的前提条件。

对于VPDN进程的说明，参考了解VPDN。

使用的组件

本文档中的信息基于以下软件和硬件版本。

- Cisco IOS软件版本12.3(6)
- L2TP接入集中器(LAC) ：Cisco AS5400接入服务器
- L2TP网络服务器(LNS) ：Cisco 7200路由器

本文档中的信息都是基于特定实验室环境中的设备创建的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您是在真实网络上操作，请确保您在使用任何命令前已经了解其潜在影响。

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

本文档使用下图所示的网络设置。

在此设置：

- 拨号的客户端用途ISDN在LAC，例如，(可能使用DSL)。
- LAC使用E1主速率接口接受呼叫。
- 没有通道已经开放在L2TP设备之间。
- 通道和会话设置根据domain-name。没有验证或授权的AAA服务器。
- 它使用两LNSs。

具体如下：

1. 客户端拨号到LAC。客户端和LAC协商LCP选项。认证阶段被执行，并且LAC获得用户名(user@cisco.com)和密码。基于域名(在我们的示例的cisco.com)，它打开会话跟随的通道对LNS1。
2. 一旦L2TP会话打开在LAC和LNS1之间， LNS1获得协商在LAC和客户端之间，与用户名和密码的LCP选项(user@cisco.com一起，密码)。
3. LNS1有有同一个域的(cisco.com)一个VPDN组在其配置方面。它开始通道和会话对LNS2。如果它没有这样一配置，通过验证客户端，协商IP地址和安装路由终止PPP会话。
4. 一旦L2TP会话打开在LNS1和LNS2之间， LNS2获得协商在LAC和客户端之间，与用户和密码的LCP选项(user@cisco.com一起，密码)。它验证用户，协商IPCP并且安装路由。

配置

本文档使用如下所示的配置。使用得命令最小数量的这里。例如， LAC不会终止任何会话，那么没有需要配置在拨号1或Group-async1接口的一个IP地址。LNS1不会终止任何PPP会话，那么那里是没有IP地址在virtual-template1下。

- LAC
- LNS1
- LNS2

LAC

```
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
!
hostname LAC
!
boot-start-marker
no boot startup-test
boot-end-marker
!
enable password 7 02050D480809
!
!
!
resource-pool disable
spe default-firmware spe-firmware-2
no aaa new-model
ip subnet-zero
no ip domain lookup
!
ip cef
! -- Enables VPDN. vpdn enable ! -- VPDN tunnel
authorization is based first on the domain name ! --
(the default is DNIS). ! vpdn search-order domain ! ! --
The LAC opens an L2TP tunnel and session to 10.48.74.113
(LNS1) ! -- using the password LACLNS1 for users whose
domain-name is cisco.com. vpdn-group 1 request-dialin
protocol l2tp domain cisco.com initiate-to ip
10.48.74.113 l2tp tunnel password LACLNS1 ! isdn switch-
type primary-net5 ! ! no voice hpi capture buffer no
voice hpi capture destination ! ! controller E1 7/0 pri-
group timeslots 1-31 ! interface FastEthernet0/0 ip
address 10.48.74.128 255.255.255.0 duplex auto speed
auto ! interface Serial7/0:15 no ip address
encapsulation ppp dialer rotary-group 1 isdn switch-type
primary-net5 ! interface Group-Async1 no ip address
encapsulation ppp async mode interactive ppp
authentication chap callin group-range 1/00 3/107 !
interface Dialer1 no ip address encapsulation ppp ppp
authentication chap callin ! ip classless no ip http
server ! ! voice-port 7/0:D ! line con 0 exec-timeout 0
0 line aux 0 line vty 0 4 line 1/00 1/107 modem InOut
transport input all line 3/00 3/107 modem InOut
transport input all ! scheduler allocate 10000 400 ! end
```

LNS1

```
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname LNS1
!
boot-start-marker
boot-end-marker
!
enable password cisco
!
clock timezone CET 1
no aaa new-model
```

```
ip subnet-zero
ip cef
!
!
no ip domain lookup
!
! -- Enables VPDN. vpdn enable ! -- Enables VPDN
multihop. vpdn multihop ! !-- LNS1 accepts L2TP
tunnel/session from the router named LAC. !-- The
password LACLNS1 is used between LAC and LNS1 for
authentication. !-- The virtual-template 1 is used for
the PPP phase. vpdn-group FromLAC accept-dialin protocol
l2tp virtual-template 1 terminate-from hostname LAC l2tp
tunnel password 0 LACLNS1 ! ! -- The LNS1 opens a L2TP
tunnel and session to 10.11.0.2 (LNS2) ! -- using the
password LNS1LNS2 for users whose domain-name is
cisco.com. vpdn-group TowardsLNS2 request-dialin
protocol l2tp domain cisco.com initiate-to ip 10.11.0.2
l2tp tunnel password 0 LNS1LNS2 ! ! interface
Ethernet0/0 ip address 10.48.74.113 255.255.255.0 no ip
proxy-arp half-duplex ! interface Ethernet0/1 ip address
10.11.0.1 255.255.255.0 half-duplex ! interface Virtual-
Template1 no ip address ppp authentication chap callin !
no ip http server ip classless ! ! dial-peer cor custom
! line con 0 exec-timeout 0 0 line aux 0 line vty 0 4
exec-timeout 0 0 password ww login ! ntp clock-period
17208915 ntp server 10.48.75.134 ! ! end
```

LNS2

```
version 12.3
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname LNS2
!
boot-start-marker
boot-end-marker
!
enable password cisco
!
username user@cisco.com password 0 cisco
no aaa new-model
ip subnet-zero
!
!
ip cef
!
!-- Enables VPDN. vpdn enable ! !-- LNS2 accepts L2TP
tunnel/session from the router named LNS1. !-- The
password LNS1LNS2 is used between LNS1 and LNS2 for
authentication. !-- The virtual-template 1 is used for
the PPP phase. vpdn-group FromLNS1 ! Default L2TP VPDN
group accept-dialin protocol l2tp virtual-template 1
l2tp tunnel password 0 LNS1LNS2 ! ! interface Loopback0
ip address 192.168.1.1 255.255.255.0 ! interface
Ethernet3/0 ip address 10.11.0.2 255.255.255.0 duplex
half ! interface Virtual-Template1 ip unnumbered
Loopback0 peer default ip address pool VpdnUsers ppp
authentication chap callin ! ip local pool VpdnUsers
192.168.1.2 192.168.1.254 ip classless no ip http server
! ! line con 0 exec-timeout 0 0 transport preferred all
transport output all stopbits 1 line aux 0 transport
```

```
preferred all transport output all stopbits 1 line vty 0
4 login transport preferred all transport input all
transport output all ! ! ! 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。

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。

- **show vpdn** -显示关于活动L2TP的信息或L2F协议通道和消息标识符在VPDN。
- **show caller user***用户***详细信息**-请显示来电者信息。

从使用这些on命令的输出LAC、LNS1和LNS2显示此处：

```
LAC#show vpdn L2TP Tunnel and Session Information Total tunnels 1 sessions 1 LocID RemID Remote
Name State Remote Address Port Sessions VPDN Group 18693 28416 LNS1 est 10.48.74.113 1701 1 1
LocID RemID TunID Intf Username State Last Chg Uniq ID 19 21 18693 Se7/0:3 user@cisco.com est
00:02:04 28 %No active L2F tunnels %No active PPTP tunnels LAC#
```

我们看到LNS1有有一会话的两个通道在其中每一。

```
LNS1#show vpdn L2TP Tunnel and Session Information Total tunnels 2 sessions 2 LocID RemID Remote
Name State Remote Address Port Sessions VPDN Group 28416 18693 LAC est 10.48.74.128 1701 1
FromLAC LocID RemID TunID Intf Username State Last Chg Uniq ID 21 19 28416 SSS Circuit
user@cisco.com est 00:02:25 13 LocID RemID Remote Name State Remote Address Port Sessions VPDN
Group 30255 35837 LNS2 est 10.11.0.2 1701 1 TowardsLNS2 LocID RemID TunID Intf Username State
Last Chg Uniq ID 22 9 30255 SSS Circuit user@cisco.com est 00:02:25 13 %No active L2F tunnels
%No active PPTP tunnels LNS1#
LNS2#show vpdn L2TP Tunnel and Session Information Total tunnels 1 sessions 1 LocID RemID Remote
Name State Remote Address Port Sessions VPDN Group 35837 30255 LNS1 est 10.11.0.1 1701 1
FromLNS1 LocID RemID TunID Intf Username State Last Chg Uniq ID 9 22 35837 Vi2.1 user@cisco.com
est 00:03:22 8 %No active L2F tunnels %No active PPTP tunnels LNS2# LNS2#show caller user
user@cisco.com detail User: user@cisco.com, line Vi2.1, service PPPoVPDN Connected for 00:03:33,
Idle for 00:00:58 Timeouts: Limit Remaining Timer Type - - - PPP: LCP Open, CHAP (<-), IPCP LCP:
-> peer, AuthProto, MagicNumber <- peer, MagicNumber, EndpointDisc NCP: Open IPCP IPCP: <- peer,
Address -> peer, Address IP: Local 192.168.1.1, remote 192.168.1.2 Counts: 56 packets input,
2562 bytes 57 packets output, 2570 bytes LNS2#
```

故障排除

本部分提供的信息可用于对配置进行故障排除。

故障排除命令

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。

注意： 在发出 **debug** 命令之前，请参阅有关 Debug 命令的重要信息。

在LAC的故障排除命令

- **debug isdn q931** - 显示关于呼叫建立及拆线、本地路由器(用户端)和网络之间的ISDN网络连接(第三层)断开的信息。
- **debug vpdn event** -显示是一正常隧道建立的一部分或关闭VPDN的L2TP错误和事件。

- **debug vpdn error** -排除故障Layer2隧道协议版本3 (L2TPv3)和建立隧道基础设施的周围的Layer2。
- **debug vpdn l2x-events** -显示起因于协议特殊化情况的事件。
- **VPDN l2x-errors** -显示在协议特殊化情况生成的错误。
- **debug ppp协商**-，如果客户端通过PPP协商，显示。您能看到什么选项(例如，回拨或MLP)，并且什么协议(例如IP和IPX)协商。

在LNS1的故障排除命令

- **debug vpdn event**
- **debug vpdn error**
- **debug vpdn l2x事件**
- **VPDN l2x-erro**
- **debug ppp negotiation**
- **debug vtemplate错误**-显示从一个虚拟模板被克隆到时间虚拟访问接口下来的一个虚拟访问接口的克隆信息从时间，当呼叫结束时。
- **debug vtemplate事件**-显示从一个虚拟模板被克隆到时间虚拟访问接口下来的一个虚拟访问接口的克隆信息从时间，当呼叫结束时。

在LNS2的故障排除命令

同一样LNS1，但是用一个其它命令：

- **debug ip peer** -，当池组定义时，显示地址活动并且包含更多输出。

Debug输出- LAC

在LAC的debug输出如下：

```
LAC#
*Apr 23 08:55:23.579: ISDN Se7/0:15 Q931: RX <- SETUP pd = 8  callref = 0x256F
        Sending Complete
        Bearer Capability i = 0x8890
                Standard = CCITT
                Transer Capability = Unrestricted Digital
                Transfer Mode = Circuit
                Transfer Rate = 64 kbit/s
        Channel ID i = 0xA18384
                Preferred, Channel 4
        Calling Party Number i = 0xA1, '8101'
                Plan:ISDN, Type:National
        Called Party Number i = 0x81, '7070'
                Plan:ISDN, Type:Unknown
        Locking Shift to Codeset 6
        Codeset 6 IE 0x28  i = 'TAC BRI 8101'
*Apr 23 08:55:23.583: ISDN Se7/0:15 Q931: TX -> CALL_PROC pd = 8  callref = 0xA56F
        Channel ID i = 0xA98384
                Exclusive, Channel 4
*Apr 23 08:55:23.583: ISDN Se7/0:15 Q931: TX -> CONNECT pd = 8  callref = 0xA56F
        Channel ID i = 0xA98384
                Exclusive, Channel 4
*Apr 23 08:55:23.583: Se7/0:3 PPP: Using dialer call direction
*Apr 23 08:55:23.583: Se7/0:3 PPP: Treating connection as a callin
*Apr 23 08:55:23.583: Se7/0:3 PPP: Phase is ESTABLISHING, Passive Open
```

```
*Apr 23 08:55:23.583: Se7/0:3 LCP: State is Listen
*Apr 23 08:55:23.607: ISDN Se7/0:15 Q931: RX <- CONNECT_ACK pd = 8
callref = 0x256F
*Apr 23 08:55:23.695: Se7/0:3 LCP: I CONFREQ [Listen] id 180 len 31
*Apr 23 08:55:23.695: Se7/0:3 LCP:    MagicNumber 0x9028FFED (0x05069028FFED)
*Apr 23 08:55:23.695: Se7/0:3 LCP:    MRRU 1524 (0x110405F4)
*Apr 23 08:55:23.695: Se7/0:3 LCP:    EndpointDisc 1 user@cisco.com
*Apr 23 08:55:23.695: Se7/0:3 LCP:     (0x131101757365724063697363F2E636F)
*Apr 23 08:55:23.695: Se7/0:3 LCP:     (0x6D)
*Apr 23 08:55:23.695: Se7/0:3 LCP: O CONFREQ [Listen] id 1 len 15
*Apr 23 08:55:23.695: Se7/0:3 LCP:    AuthProto CHAP (0x0305C22305)
*Apr 23 08:55:23.695: Se7/0:3 LCP:    MagicNumber 0x050E44FB (0x0506050E44FB)
*Apr 23 08:55:23.695: Se7/0:3 LCP: O CONFREJ [Listen] id 180 len 8
*Apr 23 08:55:23.695: Se7/0:3 LCP:    MRRU 1524 (0x110405F4)
*Apr 23 08:55:23.727: Se7/0:3 LCP: I CONFACK [REQsent] id 1 len 15
*Apr 23 08:55:23.727: Se7/0:3 LCP:    AuthProto CHAP (0x0305C22305)
*Apr 23 08:55:23.727: Se7/0:3 LCP:    MagicNumber 0x050E44FB (0x0506050E44FB)
*Apr 23 08:55:23.751: Se7/0:3 LCP: I CONFREQ [ACKrcvd] id 181 len 27
*Apr 23 08:55:23.751: Se7/0:3 LCP:    MagicNumber 0x9028FFED (0x05069028FFED)
*Apr 23 08:55:23.751: Se7/0:3 LCP:    EndpointDisc 1 user@cisco.com
*Apr 23 08:55:23.751: Se7/0:3 LCP:     (0x131101757365724063697363F2E636F)
*Apr 23 08:55:23.751: Se7/0:3 LCP:     (0x6D)
*Apr 23 08:55:23.751: Se7/0:3 LCP: O CONFACK [ACKrcvd] id 181 len 27
*Apr 23 08:55:23.751: Se7/0:3 LCP:    MagicNumber 0x9028FFED (0x05069028FFED)
*Apr 23 08:55:23.751: Se7/0:3 LCP:    EndpointDisc 1 user@cisco.com
*Apr 23 08:55:23.751: Se7/0:3 LCP:     (0x131101757365724063697363F2E636F)
*Apr 23 08:55:23.751: Se7/0:3 LCP:     (0x6D)
*Apr 23 08:55:23.751: Se7/0:3 LCP: State is Open
*Apr 23 08:55:23.751: Se7/0:3 PPP: Phase is AUTHENTICATING, by this end
*Apr 23 08:55:23.751: Se7/0:3 CHAP: O CHALLENGE id 1 len 24 from "LAC"
*Apr 23 08:55:23.803: Se7/0:3 CHAP: I RESPONSE id 1 len 35 from "user@cisco.com"
*Apr 23 08:55:23.803: Se7/0:3 PPP: Phase is FORWARDING, Attempting Forward
*Apr 23 08:55:23.807:  Tnl/Sn 18693/19 L2TP: Session FS enabled
*Apr 23 08:55:23.807:  Tnl/Sn 18693/19 L2TP: Session state change
from idle to wait-for-tunnel
*Apr 23 08:55:23.807: Se7/0:3 Tnl/Sn 18693/19 L2TP: Create session
*Apr 23 08:55:23.807:  Tnl 18693 L2TP: SM State idle
*Apr 23 08:55:23.807:  Tnl 18693 L2TP: O SCCRQ
*Apr 23 08:55:23.807:  Tnl 18693 L2TP: Control channel retransmit delay
set to 1 seconds
*Apr 23 08:55:23.807:  Tnl 18693 L2TP: Tunnel state change from idle to
wait-ctl-reply
*Apr 23 08:55:23.807:  Tnl 18693 L2TP: SM State wait-ctl-reply
*Apr 23 08:55:23.815:  Tnl 18693 L2TP: I SCCRP from LNS1
*Apr 23 08:55:23.815:  Tnl 18693 L2TP: Got a challenge from remote peer, LNS1
*Apr 23 08:55:23.815:  Tnl 18693 L2TP: Got a response from remote peer, LNS1
*Apr 23 08:55:23.815:  Tnl 18693 L2TP: Tunnel Authentication success
*Apr 23 08:55:23.815:  Tnl 18693 L2TP: Tunnel state change from
wait-ctl-reply to established
*Apr 23 08:55:23.815:  Tnl 18693 L2TP: O SCCCN  to LNS1 tnlid 28416
*Apr 23 08:55:23.815:  Tnl 18693 L2TP: Control channel retransmit
delay set to 1 seconds
*Apr 23 08:55:23.815:  Tnl 18693 L2TP: SM State established
*Apr 23 08:55:23.815: Se7/0:3 Tnl/Sn 18693/19 L2TP: O ICRQ to LNS1 28416/0
*Apr 23 08:55:23.815: Se7/0:3 Tnl/Sn 18693/19 L2TP: Session state change
from wait-for-tunnel to wai
t-reply
*Apr 23 08:55:23.831: Se7/0:3 Tnl/Sn 18693/19 L2TP: O ICCN to LNS1 28416/21
*Apr 23 08:55:23.831:  Tnl 18693 L2TP: Control channel retransmit delay
set to 1 seconds
*Apr 23 08:55:23.831: Se7/0:3 Tnl/Sn 18693/19 L2TP: Session state change
from wait-reply to establis
hed
*Apr 23 08:55:23.831: Se7/0:3 Tnl/Sn 18693/19 L2TP: VPDN session up
```

```
*Apr 23 08:55:23.831: Se7/0:3 PPP: Phase is FORWARDED, Session Forwarded
*Apr 23 08:55:23.831: Se7/0:3 PPP: Process pending packets
LAC#
```

Debug输出- LNS1

在LNS1的debug输出如下：

```
LNS1#
.Apr 23 08:57:08.900: L2TP: I SCCRQ from LAC tnl 18693
.Apr 23 08:57:08.900:  Tnl 28416 L2TP: Got a challenge in SCCRQ, LAC
.Apr 23 08:57:08.900:  Tnl 28416 L2TP: New tunnel created for remote LAC,
address 10.48.74.128
.Apr 23 08:57:08.904:  Tnl 28416 L2TP: O SCCRP  to LAC tnlid 18693
.Apr 23 08:57:08.904:  Tnl 28416 L2TP: Control channel retransmit delay
set to 1 seconds
.Apr 23 08:57:08.904:  Tnl 28416 L2TP: Tunnel state change from idle to
wait-ctl-reply
.Apr 23 08:57:08.908:  Tnl 28416 L2TP: I SCCCN from LAC tnl 18693
.Apr 23 08:57:08.908:  Tnl 28416 L2TP: Got a Challenge Response in
SCCCN from LAC
.Apr 23 08:57:08.912:  Tnl 28416 L2TP: Tunnel Authentication success
.Apr 23 08:57:08.912:  Tnl 28416 L2TP: Tunnel state change from
wait-ctl-reply to established
.Apr 23 08:57:08.912:  Tnl 28416 L2TP: SM State established
.Apr 23 08:57:08.912:  Tnl 28416 L2TP: I ICRQ from LAC tnl 18693
.Apr 23 08:57:08.916:  Tnl/Sn 28416/21 L2TP: Session FS enabled
.Apr 23 08:57:08.916:  Tnl/Sn 28416/21 L2TP: Session state change
from idle to wait-connect
.Apr 23 08:57:08.916:  Tnl/Sn 28416/21 L2TP: New session created
.Apr 23 08:57:08.916:  Tnl/Sn 28416/21 L2TP: O ICRP to LAC 18693/19
.Apr 23 08:57:08.920:  Tnl 28416 L2TP: Control channel retransmit
delay set to 1 seconds
.Apr 23 08:57:08.924:  Tnl/Sn 28416/21 L2TP:
I ICCN from LAC tnl 18693, cl 19
.Apr 23 08:57:08.924: user@cisco.com Tnl/Sn 28416/21 L2TP:
Session state change from wait-connect to wait-for-service-selection
.Apr 23 08:57:08.932: ppp13 PPP: Phase is ESTABLISHING
.Apr 23 08:57:08.932: ppp13 LCP: I FORCED rcvd CONFACK len 11
.Apr 23 08:57:08.932: ppp13 LCP:    AuthProto CHAP (0x0305C22305)
.Apr 23 08:57:08.936: ppp13 LCP:    MagicNumber 0x050E44FB (0x0506050E44FB)
.Apr 23 08:57:08.936: ppp13 LCP: I FORCED sent CONFACK len 23
.Apr 23 08:57:08.936: ppp13 LCP:    MagicNumber 0x9028FFED (0x05069028FFED)
.Apr 23 08:57:08.936: ppp13 LCP:    EndpointDisc 1 user@cisco.com
.Apr 23 08:57:08.936: ppp13 LCP:     (0x131101757365724063697363 6F2E636F)
.Apr 23 08:57:08.936: ppp13 LCP:     (0x6D)
.Apr 23 08:57:08.940: ppp13 PPP: Phase is FORWARDING, Attempting Forward
.Apr 23 08:57:08.948:  Tnl/Sn 30255/22 L2TP: Session FS enabled
.Apr 23 08:57:08.952:  Tnl/Sn 30255/22 L2TP: Session state change
from idle to wait-for-tunnel
.Apr 23 08:57:08.952: uid:13 Tnl/Sn 30255/22 L2TP: Create session
.Apr 23 08:57:08.952:  Tnl 30255 L2TP: SM State idle
.Apr 23 08:57:08.952:  Tnl 30255 L2TP: O SCCRQ
.Apr 23 08:57:08.956:  Tnl 30255 L2TP: Control channel retransmit
delay set to 1 seconds
.Apr 23 08:57:08.956:  Tnl 30255 L2TP: Tunnel state change from
idle to wait-ctl-reply
.Apr 23 08:57:08.956:  Tnl 30255 L2TP: SM State wait-ctl-reply
.Apr 23 08:57:08.960:  Tnl 30255 L2TP: I SCCRP from LNS2
.Apr 23 08:57:08.960:  Tnl 30255 L2TP: Got a challenge from remote peer, LNS2
.Apr 23 08:57:08.964:  Tnl 30255 L2TP: Got a response from remote peer, LNS2
.Apr 23 08:57:08.964:  Tnl 30255 L2TP: Tunnel Authentication success
```

```
.Apr 23 08:57:08.964:  Tnl 30255 L2TP: Tunnel state change from
wait-ctl-reply to established
.Apr 23 08:57:08.964:  Tnl 30255 L2TP: O SCCCN  to LNS2 tnlid 35837
.Apr 23 08:57:08.968:  Tnl 30255 L2TP: Control channel retransmit
delay set to 1 seconds
.Apr 23 08:57:08.968:  Tnl 30255 L2TP: SM State established
.Apr 23 08:57:08.968: uid:13 Tnl/Sn 30255/22 L2TP: O ICRQ to LNS2 35837/0
.Apr 23 08:57:08.968: uid:13 Tnl/Sn 30255/22 L2TP: Session state
change from wait-for-tunnel to wait-reply
.Apr 23 08:57:08.972: uid:13 Tnl/Sn 30255/22 L2TP: O ICCN to LNS2 35837/9
.Apr 23 08:57:08.976:  Tnl 30255 L2TP: Control channel retransmit
delay set to 1 seconds
.Apr 23 08:57:08.976: uid:13 Tnl/Sn 30255/22 L2TP: Session state
change from wait-reply to established
.Apr 23 08:57:08.976: uid:13 Tnl/Sn 30255/22 L2TP: VPDN session up
.Apr 23 08:57:08.980: ppp13 PPP: Phase is FORWARDED, Session Forwarded
.Apr 23 08:57:08.984: user@cisco.com Tnl/Sn 28416/21 L2TP:
Session state change from wait-for-service-selection to established
.Apr 23 08:57:08.984: user@cisco.com Tnl/Sn 28416/21 L2TP: VPDN session up
.Apr 23 08:57:08.984: ppp13 PPP: Process pending ncp packets
LNS1#
```

Debug输出- LNS2

在LNS2的debug输出如下：

```
LNS2#
*Apr 23 08:57:59.615: L2TP: I SCCRQ from LNS1 tnl 30255
*Apr 23 08:57:59.615:  Tnl 35837 L2TP: Got a challenge in SCCRQ, LNS1
*Apr 23 08:57:59.615:  Tnl 35837 L2TP: New tunnel created for remote LNS1,
address 10.11
.0.1
*Apr 23 08:57:59.615:  Tnl 35837 L2TP: O SCCRP  to LNS1 tnlid 30255
*Apr 23 08:57:59.615:  Tnl 35837 L2TP: Control channel retransmit delay
set to 1 seconds
*Apr 23 08:57:59.615:  Tnl 35837 L2TP: Tunnel state change from idle to
wait-ctl-reply
*Apr 23 08:57:59.623:  Tnl 35837 L2TP: I SCCCN from LNS1 tnl 30255
*Apr 23 08:57:59.623:  Tnl 35837 L2TP: Got a Challenge Response in
SCCCN from LNS1
*Apr 23 08:57:59.623:  Tnl 35837 L2TP: Tunnel Authentication success
*Apr 23 08:57:59.623:  Tnl 35837 L2TP: Tunnel state change from
wait-ctl-reply to establ
ished
*Apr 23 08:57:59.623:  Tnl 35837 L2TP: SM State established
*Apr 23 08:57:59.627:  Tnl 35837 L2TP: I ICRQ from LNS1 tnl 30255
*Apr 23 08:57:59.627:  Tnl/Sn 35837/9 L2TP: Session FS enabled
*Apr 23 08:57:59.627:  Tnl/Sn 35837/9 L2TP: Session state change
from idle to wait-conne
ct
*Apr 23 08:57:59.627:  Tnl/Sn 35837/9 L2TP: New session created
*Apr 23 08:57:59.627:  Tnl/Sn 35837/9 L2TP: O ICRP to LNS1 30255/22
*Apr 23 08:57:59.627:  Tnl 35837 L2TP: Control channel retransmit
delay set to 1 seconds
*Apr 23 08:57:59.635:  Tnl/Sn 35837/9 L2TP: I ICCN from LNS1 tnl 30255, cl 22
*Apr 23 08:57:59.635: user@cisco.com Tnl/Sn 35837/9 L2TP: Session state
change from wait - connect to wait-for-service-selection
*Apr 23 08:57:59.635: ppp8 PPP: Phase is ESTABLISHING
*Apr 23 08:57:59.635: ppp8 LCP: I FORCED rcvd CONFACK len 11
*Apr 23 08:57:59.635: ppp8 LCP:    AuthProto CHAP (0x0305C22305)
*Apr 23 08:57:59.635: ppp8 LCP:    MagicNumber 0x050E44FB (0x0506050E44FB)
*Apr 23 08:57:59.635: ppp8 LCP: I FORCED sent CONFACK len 23
*Apr 23 08:57:59.635: ppp8 LCP:    MagicNumber 0x9028FFED (0x05069028FFED)
```

```
*Apr 23 08:57:59.635: ppp8 LCP:    EndpointDisc 1 user@cisco.com
*Apr 23 08:57:59.635: ppp8 LCP:     (0x131101757365724063697363F2E636F)
*Apr 23 08:57:59.635: ppp8 LCP:     (0x6D)
*Apr 23 08:57:59.635: ppp8 PPP: Phase is FORWARDING, Attempting Forward
*Apr 23 08:57:59.639: ppp8 PPP: Phase is AUTHENTICATING, Unauthenticated User
*Apr 23 08:57:59.639: ppp8 PPP: Phase is FORWARDING, Attempting Forward
*Apr 23 08:57:59.639: VT[Vi2]:Sending vaccess request, id 0x73000015
*Apr 23 08:57:59.639: VT:Processing vaccess requests, 1 outstanding
*Apr 23 08:57:59.639: VT:Create and clone subif, base Vi2 Vt1
*Apr 23 08:57:59.639: VT[Vi2.1]:Reuse subinterface, recycle queue size 1
*Apr 23 08:57:59.639: VT[Vi2.1]:Recycled subinterface becomes Vi2.1
*Apr 23 08:57:59.639: VT[Vi2.1]:Cloning a recycled vaccess
*Apr 23 08:57:59.639: VT[Vi2.1]:Processing vaccess response,
id 0x73000015, result success (1)
*Apr 23 08:57:59.643: Vi2.1 Tnl/Sn 35837/9 L2TP:
Virtual interface created for user@cisco.com, bandwidth 64 Kbps
*Apr 23 08:57:59.643: Vi2.1 Tnl/Sn 35837/9 L2TP: VPDN session up
*Apr 23 08:57:59.643: Vi2.1 Tnl/Sn 35837/9 L2TP:
Session state change from wait-for-service-selection to established
*Apr 23 08:57:59.643: Vi2.1 PPP: Phase is AUTHENTICATING, Authenticated User
*Apr 23 08:57:59.643: Vi2.1 CHAP: O SUCCESS id 1 len 4
*Apr 23 08:57:59.643: Vi2.1 PPP: Phase is UP
*Apr 23 08:57:59.643: Vi2.1 PPP: Process pending ncp packets
*Apr 23 08:57:59.643: Vi2.1 IPCP: O CONFREQ [Closed] id 1 len 10
*Apr 23 08:57:59.643: Vi2.1 IPCP:    Address 192.168.1.1 (0x0306C0A80101)
*Apr 23 08:57:59.667: Vi2.1 IPCP: I CONFREQ [REQsent] id 125 len 10
*Apr 23 08:57:59.667: Vi2.1 IPCP:    Address 0.0.0.0 (0x030600000000)
*Apr 23 08:57:59.667: Vi2.1 AAA/AUTHOR/IPCP: Start.  Her address 0.0.0.0,
we want 0.0.0.0
*Apr 23 08:57:59.667: Vi2.1 AAA/AUTHOR/IPCP: Done.  Her address 0.0.0.0,
we want 0.0.0.0
*Apr 23 08:57:59.667: Vi2.1: Pools to search : VpdnUsers
*Apr 23 08:57:59.667: Vi2.1: Pool VpdnUsers returned address = 192.168.1.2
*Apr 23 08:57:59.667: Vi2.1 IPCP: Pool returned 192.168.1.2
*Apr 23 08:57:59.667: Vi2.1 IPCP: O CONFNAK [REQsent] id 125 len 10
*Apr 23 08:57:59.667: Vi2.1 IPCP:    Address 192.168.1.2 (0x0306C0A80102)
*Apr 23 08:57:59.683: Vi2.1 IPCP: I CONFACK [REQsent] id 1 len 10
*Apr 23 08:57:59.683: Vi2.1 IPCP:    Address 192.168.1.1 (0x0306C0A80101)
*Apr 23 08:57:59.699: Vi2.1 IPCP: I CONFREQ [ACKrcvd] id 126 len 10
*Apr 23 08:57:59.699: Vi2.1 IPCP:    Address 192.168.1.2 (0x0306C0A80102)
*Apr 23 08:57:59.699: Vi2.1 IPCP: O CONFACK [ACKrcvd] id 126 len 10
*Apr 23 08:57:59.699: Vi2.1 IPCP:    Address 192.168.1.2 (0x0306C0A80102)
*Apr 23 08:57:59.699: Vi2.1 IPCP: State is Open
*Apr 23 08:57:59.703: Vi2.1 IPCP: Install route to 192.168.1.2
*Apr 23 08:57:59.703: Vi2.1 IPCP: Add link info for cef entry 192.168.1.2
LNS2#
```

相关信息

- 第二层隧道协议
- 多跳VPDN
- 接入拨号技术支持页面
- 技术支持 - Cisco Systems