

Балансировка нагрузки L2TP и отработка отказа

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Введение

Этот документ объясняет возможности Концентратора доступа L2TP (LAC), который выполняет распределение нагрузки и функции аварийного переключения ко множественным L2TP Network Server (LNS).

Предварительные условия

Требования

Для этого документа отсутствуют особые требования.

Используемые компоненты

Настоящий документ не имеет жесткой привязки к каким-либо конкретным версиям программного обеспечения и оборудования.

Условные обозначения

[Дополнительные сведения об условных обозначениях см. в документе Условные обозначения технических терминов Cisco.](#)

Распределение нагрузки LNS

При использовании RADIUS для отправки сведений о туннеле виртуальной частной коммутируемой сети (VPDN) LAC возможно передать пользователям того же сервиса идентификации набранного номера (DNIS) или домена ко множественному LNS. Это - требование, когда входящие туннели и открывают сеанс потребность, которая будет разделена через множественный LNSs, чтобы способствовать распределению нагрузки и предложить более высокие уровни резервирования. Для активации опции распределения нагрузки, IP-адресов для каждого LNS, который доступен, когда конечная точка туннеля должна быть отправлена в паре атрибут/значение определяемого поставщиком атрибута (VSA) Cisco.

```
Cisco:Avpair = "vpdn:ip-addresses=10.51.6.82,10.51.6.59"
```

", используется в качестве разделителя, чтобы указать, что существует несколько конечных точек, доступные LAC (можно также использовать пространство как разделитель для указания на равный приоритет конечных точек туннеля). LAC выбирает который конечная точка использовать на основе произвольного выбора первого отправленного неактивного IP-адреса. Если это занято (LAC не может соединиться с IP-адресом), следующий IP-адрес выбран. Если нет никаких доступных неактивных IP-адресов, следующий выбор основывается на IP-адресе, который находится в 'открытом состоянии туннеля', и наконец IP-адресе, который 'ожидает состояние туннеля'.

Аварийное переключение LNS

Программное обеспечение Cisco IOS позволяет максимум шести уровней приоритета при использовании множественного LNSs. При помощи '/' как разделитель, можно назначить другие приоритетные группы на LNS, которые загружены к LAC. Это позволяет определенному LNSs действовать в качестве основного LNS и других как резервная копия. Как прежде, конечные точки туннеля отправлены в паре атрибут/значение VSA Cisco.

```
Cisco:Avpair = "vpdn:ip-addresses=10.51.6.82/10.51.6.59"
```

'/' разделитель указывает, что 10.51.6.82 находится в Приоритетной группе 1, и 10.51.6.59 находится в Приоритетной группе 2.

Распределение нагрузки LNS и аварийное переключение

Возможно использовать и распределение нагрузки и аварийное переключение в том же профиле. Это достигнуто при помощи пары атрибут/значение VSA Cisco "vpdn:ip-addresses", как показано здесь:

```
Cisco:Avpair = "vpdn:ip-addresses=  
1.1.1.1,2.2.2.2/3.3.3.3,4.4.4.4/5.5.5.5,6.6.6.6"
```

Это интерпретируется как:

- конечные точки туннеля 1.1.1.1 и 2.2.2.2 находятся в Приоритетной группе 1

- конечные точки туннеля 3.3.3.3 и 4.4.4.4 находятся в Приоритетной группе 2
- конечные точки туннеля 5.5.5.5 и 6.6.6.6 находятся в Приоритетной группе 3

Функция распределения нагрузки выполнена на Приоритетной группе 1 - non-active/non-busy, открытый, ожидая. Если ни один не доступен в этом уровне приоритета, переходит к следующему уровню приоритета и продолжает логику выбора.

Лабораторное испытание

Тестирование в этом разделе показывает три других сценария для использования функции аварийного переключения и распределение нагрузки:

- Использование распределения нагрузки LNS Cisco определяемый производителем характеристика / оценивает пар
- Использование Аварийного переключения LNS Cisco определяемый производителем характеристика / оценивает пар
- Распределение нагрузки LNS и использование аварийного переключения Cisco определяемый производителем характеристика / оценивают пар

Использование Распределения нагрузки LNS Cisco Определяемые производителем характеристика Пары Значения /

Профиль RADIUS

ПОЛЬЗОВАТЕЛЬ RADIUS и туннель представляют на Сервере Merit RADIUS 3.6B:

```
2500-1 Password = "cisco"
Service-Type = Framed,
Framed-Protocol = PPP,
Framed-IP-Address = 255.255.255.255
```

```
dnis:614629 Password = "cisco"
Service-Type = Outbound,
Cisco:Avpair = "vpdn:tunnel-type=l2tp",
Cisco:Avpair = "vpdn:tunnel-id=hgw",
Cisco:Avpair = "vpdn:ip-addresses=10.51.6.82,10.51.6.59",
Cisco:Avpair = "vpdn:l2tp-tunnel-password=hello"
```

Конфигурация LAC

```
aaa new-model
!--- Enables Authentication, Authorization and Accounting functionality. aaa group server radius
NSA_LAB server 10.51.6.3 auth-port 1645 acct-port 0 non-standard ! aaa authentication login
default local aaa authentication ppp default local group NSA_LAB aaa authentication ppp DIAL
group NSA_LAB local aaa authorization network default group NSA_LAB local aaa authorization
network DIAL group NSA_LAB local !--- Authentication and Authorization will be implemented !---
in sequence by the methods configured. vpdn enable !--- Enables the VPDN feature. no vpdn
logging vpdn search-order dnis !--- Once LCP state is open, the dialed number is checked !--- to
see if the remote is a VPDN user. interface Serial0:15 no ip address encapsulation ppp no
logging event link-status dialer rotary-group 1 dialer-group 1 autodetect encapsulation ppp v120
no snmp trap link-status isdn switch-type primary-net5 isdn incoming-voice modem compress stac !
interface Dialer1 ip unnumbered Loopback0 encapsulation ppp no ip mroute-cache dialer-group 1
autodetect encapsulation ppp v120 !--- Allows the encapsulation type to be dynamically set if
the call !--- type is not identified in the ISDN Q.931 Lower Layer Compatibility. peer default
ip address pool default compress stac ppp authentication chap pap DIAL ppp authorization DIAL !-
-- The list-name DIAL is configured, that PPP Authentication and !--- Authorization will use.
```

```
ppp chap hostname 5300-1 !--- The name 5300-1 is used for all CHAP challenge and response on !--
- this interface. ppp multilink ! radius-server host 10.51.6.3 auth-port 1645 acct-port 1646
non-standard !--- 'non-standard' indicates that the RADIUS Server will use !--- non standard
RADIUS attributes.
```

Конфигурация LNS

```
aaa new-model
```

```
!--- Enables Authentication, Authorization and Accounting functionality. aaa authentication
login default local aaa authentication enable default group radius enable aaa authentication ppp
default local aaa authentication ppp vpdn group radius none aaa authorization network default
local none aaa authorization network vpdn group radius local !--- Authentication and
Authorization will be implemented !--- in sequence by the methods configured. vpdn enable !---
Enables the VPDN feature. vpdn-group 1 accept-dialin protocol l2tp virtual-template 1 local name
l2tp-gw l2tp tunnel password 7 1211001B1E04 !--- The LNS will accept connections from the LAC
using L2TP !--- using All Virtual-Access Interfaces that are created will be cloned from !---
Virtual-Template 1. The name 'l2tp-gw' is used to identify the password, !--- that will
authenticate the tunnel, is encrypted. interface Ethernet5/0 ip address 10.51.6.59 255.255.252.0
! interface Virtual-Template1 ip unnumbered Ethernet5/0 no ip route-cache cef peer default ip
address pool default ppp authentication chap vpdn ppp authorization vpdn ! radius-server host
10.51.6.3 auth-port 1645 acct-port 1646 non-standard !--- 'non-standard' identifies the RADIUS
Server will be !--- using nonstandard RADIUS attributes.
```

Отладки, взятые от LAC

```
Jan 1 00:32:54.847: %LINK-3-UPDOWN: Interface Serial0:0, changed state to up
Jan 1 00:32:55.027: Se0:0 PPP: Treating connection as a callin
Jan 1 00:32:55.027: Se0:0 PPP: Phase is ESTABLISHING, Passive Open
Jan 1 00:32:55.027: Se0:0 CHAP: Using alternate hostname 5300-1
Jan 1 00:32:55.027: Se0:0 LCP: State is Listen
Jan 1 00:32:55.027: Se0:0 LCP: I CONFREQ [Listen] id 112 len 10
- snip -
Jan 1 00:32:55.063: Se0:0 LCP: State is Open Jan 1 00:32:55.063: Se0:0 PPP: Phase is
AUTHENTICATING, by this end Jan 1 00:32:55.063: Se0:0 CHAP: Using alternate hostname 5300-1 Jan
1 00:32:55.063: Se0:0 CHAP: O CHALLENGE id 14 len 27 from "5300-1" Jan 1 00:32:55.083: Se0:0
CHAP: I RESPONSE id 14 len 27 from "2500-1" Jan 1 00:32:55.083: Se0:0 PPP: Phase is FORWARDING
Jan 1 00:32:55.083: Se0:0 VPDN: Got DNIS string 614629 Jan 1 00:32:55.083: Se0:0 VPDN: Looking
for tunnel -- dnis:614629 -- Jan 1 00:32:55.083: Serial0:0 AAA/AUTHOR/VPDN (480033158):
Port='Serial0:0' list='default' service=NET Jan 1 00:32:55.083: AAA/AUTHOR/VPDN: Serial0:0
(480033158) user='dnis:614629' Jan 1 00:32:55.087: Serial0:0 AAA/AUTHOR/VPDN (480033158): send
AV service=ppp Jan 1 00:32:55.087: Serial0:0 AAA/AUTHOR/VPDN (480033158): send AV protocol=vpdn
Jan 1 00:32:55.087: Serial0:0 AAA/AUTHOR/VPDN (480033158): found list "default" Jan 1
00:32:55.087: Serial0:0 AAA/AUTHOR/VPDN (480033158): Method=NSA_LAB (radius) Jan 1 00:32:55.087:
RADIUS: Initial Transmit Serial0:0 id 50 10.51.6.3:1645, Access-Request, len 100 Jan 1
00:32:55.087: Attribute 4 6 0A330644 Jan 1 00:32:55.087: Attribute 5 6 00000000 Jan 1
00:32:55.087: Attribute 26 17 00000009020B5365 Jan 1 00:32:55.087: Attribute 61 6 00000002 Jan 1
00:32:55.087: Attribute 1 13 646E6973 Jan 1 00:32:55.087: Attribute 30 8 36313436 Jan 1
00:32:55.087: Attribute 2 18 F0AF3BC4 Jan 1 00:32:55.087: Attribute 6 6 00000005 Jan 1
00:32:55.091: RADIUS: Received from id 50 10.51.6.3:1645, Access-Accept, len 167 Jan 1
00:32:55.091: Attribute 6 6 00000005 Jan 1 00:32:55.091: Attribute 26 29 0000000901177670 Jan 1
00:32:55.091: Attribute 26 26 0000000901147670 Jan 1 00:32:55.091: Attribute 26 47
0000000901297670 Jan 1 00:32:55.091: Attribute 26 39 0000000901217670 !--- LAC receives a call,
negotiates PPP, LCP is declared Open, !--- the dialed number is queried to ascertain if this is
a VPDN customer. !--- VPDN attempts to find an existing tunnel for the user, queries RADIUS for
!--- the tunnel information. Jan 1 00:32:55.091: RADIUS: saved authorization data for user
61F40024 at 61F9813C Jan 1 00:32:55.091: RADIUS: cisco AVPair "vpdn:tunnel-type=l2tp" Jan 1
00:32:55.091: RADIUS: cisco AVPair "vpdn:tunnel-id=hgw" Jan 1 00:32:55.091: RADIUS: cisco AVPair
"vpdn:ip-addresses=10.51.6.82,10.51.6.59" Jan 1 00:32:55.095: RADIUS: cisco AVPair "vpdn:l2tp-
tunnel-password=hello" Jan 1 00:32:55.095: AAA/AUTHOR (480033158): Post authorization status =
PASS_ADD Jan 1 00:32:55.095: AAA/AUTHOR/VPDN: Processing AV service=ppp Jan 1 00:32:55.095:
AAA/AUTHOR/VPDN: Processing AV protocol=vpdn Jan 1 00:32:55.095: AAA/AUTHOR/VPDN: Processing AV
tunnel-type=l2tp Jan 1 00:32:55.095: AAA/AUTHOR/VPDN: Processing AV tunnel-id=hgw Jan 1
00:32:55.095: AAA/AUTHOR/VPDN: Processing AV ip-addresses= 10.51.6.82,10.51.6.59 Jan 1
00:32:55.095: AAA/AUTHOR/VPDN: Processing AV l2tp-tunnel-password=hello Jan 1 00:32:55.095:
```

Se0:0 VPDN/RPMS/: Got tunnel info for dnis:614629 Jan 1 00:32:55.095: Se0:0 VPDN/RPMS/: LAC hgw
Jan 1 00:32:55.095: Se0:0 VPDN/RPMS/: l2tp-busy-disconnect yes Jan 1 00:32:55.095: Se0:0
VPDN/RPMS/: l2tp-tunnel-password xxxxxx Jan 1 00:32:55.095: Se0:0 VPDN/RPMS/: 2 IP addresses Jan
1 00:32:55.095: Se0:0 VPDN/RPMS/: IP 10.51.6.82 Priority 1 Jan 1 00:32:55.095: Se0:0 VPDN/RPMS/:
IP 10.51.6.59 Priority 1 **Jan 1 00:32:55.095: Se0:0 VPDN/: curlvl 1 Address 0: 10.51.6.82,
priority 1 Jan 1 00:32:55.095: Se0:0 VPDN/: Select non-active address 10.51.6.82, priority 1 !--
- The tunnel information is downloaded, using Cisco VSA. Two LNS IP !--- Addresses are used with
a ',' as the delimiter, indicating that both !--- have equal priority. In this case 10.51.6.82
is selected as the tunnel !--- endpoint.** Jan 1 00:32:55.095: Se0:0 VPDN: Find LNS process
created Jan 1 00:32:55.095: Tnl 49467 L2TP: SM State idle Jan 1 00:32:55.095: Tnl 49467 L2TP: O
SCCRQ Jan 1 00:32:55.099: Tnl 49467 L2TP: Tunnel state change from idle to wait-ctl-reply Jan 1
00:32:55.099: Tnl 49467 L2TP: SM State wait-ctl-reply **Jan 1 00:32:55.099: Se0:0 VPDN: Forward to
address 10.51.6.82** Jan 1 00:32:55.099: Se0:0 VPDN: Pending Jan 1 00:32:55.099: Se0:0 VPDN:
Process created Jan 1 00:32:55.191: Tnl 49467 L2TP: I SCCRP from l2tp-gw Jan 1 00:32:55.191: Tnl
49467 L2TP: Got a challenge from remote peer, l2tp-gw Jan 1 00:32:55.191: Tnl 49467 L2TP: Got a
response from remote peer, l2tp-gw Jan 1 00:32:55.191: Tnl 49467 L2TP: Tunnel Authentication
success **Jan 1 00:32:55.191: Tnl 49467 L2TP: Tunnel state change from wait-ctl-reply to
established** Jan 1 00:32:55.191: Tnl 49467 L2TP: O SCCCN to l2tp-gw tnlid 62193 Jan 1
00:32:55.195: Tnl 49467 L2TP: SM State established Jan 1 00:32:55.195: Tnl/Cl 49467/16 L2TP:
Session FS enabled Jan 1 00:32:55.195: Tnl/Cl 49467/16 L2TP: Session state change from idle to
wait-for-tunnel Jan 1 00:32:55.195: Se0:0 Tnl/Cl 49467/16 L2TP: Create session Jan 1
00:32:55.195: Tnl 49467 L2TP: SM State established Jan 1 00:32:55.195: Se0:0 Tnl/Cl 49467/16
L2TP: O ICRQ to l2tp-gw 62193/0 Jan 1 00:32:55.195: Se0:0 Tnl/Cl 49467/16 L2TP: Session state
change from wait-for-tunnel to wait-reply Jan 1 00:32:55.195: Se0:0 VPDN: 2500-1 is forwarded
Jan 1 00:32:55.327: Se0:0 Tnl/Cl 49467/16 L2TP: O ICCN to l2tp-gw 62193/17 **Jan 1 00:32:55.327:
Se0:0 Tnl/Cl 49467/16 L2TP: Session state change from wait-reply to established** Jan 1
00:32:56.195: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0:0, changed state to up Jan
1 00:33:00.851: %ISDN-6-CONNECT:Interface Serial0:0 is now connected to 2500-1 Jan 1
00:33:06.111: %ISDN-6-CONNECT: Interface Serial0:1 is now connected to N/A N/A *!--- Second call
is received by the LAC, !--- the dialed number is a VPDN customer.* Jan 1 00:33:35.027: As1 LCP:
I CONFREQ [Closed] id 1 len 23 - snip - **Jan 1 00:33:39.275: As1 LCP: State is Open** Jan 1
00:33:39.275: As1 PPP: Phase is AUTHENTICATING, by this end Jan 1 00:33:39.275: As1 CHAP: Using
alternate hostname 5300-1 Jan 1 00:33:39.275: As1 CHAP: O CHALLENGE id 2 len 27 from "5300-1"
Jan 1 00:33:39.383: As1 CHAP: I RESPONSE id 2 len 25 from "paul" Jan 1 00:33:39.383: As1 PPP:
Phase is FORWARDING **Jan 1 00:33:39.383: As1 VPDN: Got DNIS string 614629 Jan 1 00:33:39.383: As1
VPDN: Looking for tunnel -- dnis:614629 --** Jan 1 00:33:39.387: Async1 AAA/AUTHOR/VPDN
(3019717950): Port='Async1' list='default' service=NET Jan 1 00:33:39.387: AAA/AUTHOR/VPDN:
Async1 (3019717950) user='dnis:614629' Jan 1 00:33:39.387: Async1 AAA/AUTHOR/VPDN (3019717950):
send AV service=ppp Jan 1 00:33:39.387: Async1 AAA/AUTHOR/VPDN (3019717950): send AV
protocol=vpdn Jan 1 00:33:39.387: Async1 AAA/AUTHOR/VPDN (3019717950): found list "default" Jan
1 00:33:39.387: Async1 AAA/AUTHOR/VPDN (3019717950): Method=NSA_LAB (radius) Jan 1 00:33:39.387:
RADIUS: Initial Transmit Async1 id 52 10.51.6.3:1645, Access-Request, len 97 Jan 1 00:33:39.387:
Attribute 4 6 0A330644 Jan 1 00:33:39.387: Attribute 5 6 00000001 Jan 1 00:33:39.387: Attribute
26 14 0000000902084173 Jan 1 00:33:39.387: Attribute 61 6 00000000 Jan 1 00:33:39.387: Attribute
1 13 646E6973 Jan 1 00:33:39.387: Attribute 30 8 36313436 Jan 1 00:33:39.387: Attribute 2 18
E9164E4C Jan 1 00:33:39.387: Attribute 6 6 00000005 Jan 1 00:33:39.391: RADIUS: Received from id
52 10.51.6.3:1645, Access-Accept, len 167 Jan 1 00:33:39.391: Attribute 6 6 00000005 Jan 1
00:33:39.391: Attribute 26 29 0000000901177670 Jan 1 00:33:39.391: Attribute 26 26
0000000901147670 Jan 1 00:33:39.391: Attribute 26 47 0000000901297670 Jan 1 00:33:39.391:
Attribute 26 39 0000000901217670 Jan 1 00:33:39.391: RADIUS: saved authorization data for user
621904CC at 61FAB9EC Jan 1 00:33:39.391: RADIUS: cisco AVPair "vpdn:tunnel-type=l2tp" Jan 1
00:33:39.391: RADIUS: cisco AVPair "vpdn:tunnel-id=hgw" Jan 1 00:33:39.391: RADIUS: cisco AVPair
"vpdn:ip-addresses=10.51.6.82,10.51.6.59" Jan 1 00:33:39.391: RADIUS: cisco AVPair "vpdn:l2tp-
tunnel-password=hello" Jan 1 00:33:39.395: AAA/AUTHOR (3019717950): Post authorization status =
PASS_ADD Jan 1 00:33:39.395: AAA/AUTHOR/VPDN: Processing AV service=ppp Jan 1 00:33:39.395:
AAA/AUTHOR/VPDN: Processing AV protocol=vpdn Jan 1 00:33:39.395: AAA/AUTHOR/VPDN: Processing AV
tunnel-type=l2tp Jan 1 00:33:39.395: AAA/AUTHOR/VPDN: Processing AV tunnel-id=hgw Jan 1
00:33:39.395: AAA/AUTHOR/VPDN: Processing AV ip-addresses=10.51.6.82,10.51.6.59 Jan 1
00:33:39.395: AAA/AUTHOR/VPDN: Processing AV l2tp-tunnel-password=hello Jan 1 00:33:39.395: As1
VPDN/RPMS/: Got tunnel info for dnis:614629 Jan 1 00:33:39.395: As1 VPDN/RPMS/: LAC hgw Jan 1
00:33:39.395: As1 VPDN/RPMS/: l2tp-busy-disconnect yes Jan 1 00:33:39.395: As1 VPDN/RPMS/: l2tp-
tunnel-password xxxxxx Jan 1 00:33:39.395: As1 VPDN/RPMS/: 2 IP addresses Jan 1 00:33:39.395:
As1 VPDN/RPMS/: IP 10.51.6.82 Priority 1 Jan 1 00:33:39.395: As1 VPDN/RPMS/: IP 10.51.6.59
Priority 1 Jan 1 00:33:39.395: As1 VPDN/: curlvl 1 Address 1: 10.51.6.59, priority 1 **Jan 1**

00:33:39.395: As1 VPDN/: Select non-active address 10.51.6.59, priority 1 !--- The second non-active endpoint is selected 10.51.6.59 !--- and the control connection is established. Jan 1 00:33:39.395: As1 VPDN: Find LNS process created Jan 1 00:33:39.395: Tnl 20770 L2TP: SM State idle Jan 1 00:33:39.395: Tnl 20770 L2TP: O SCCRQ Jan 1 00:33:39.399: Tnl 20770 L2TP: Tunnel state change from idle to wait-ctl-reply Jan 1 00:33:39.399: Tnl 20770 L2TP: SM State wait-ctl-reply Jan 1 00:33:39.399: As1 VPDN: Forward to address 10.51.6.59 Jan 1 00:33:39.399: As1 VPDN: Pending Jan 1 00:33:39.399: As1 VPDN: Process created Jan 1 00:33:39.399: Tnl 20770 L2TP: I SCCRP from l2tp-gw Jan 1 00:33:39.399: Tnl 20770 L2TP: Got a challenge from remote peer, l2tp-gw Jan 1 00:33:39.399: Tnl 20770 L2TP: Got a response from remote peer, l2tp-gw Jan 1 00:33:39.399: Tnl 20770 L2TP: Tunnel Authentication success Jan 1 00:33:39.399: Tnl 20770 L2TP: Tunnel state change from wait-ctl-reply to established Jan 1 00:33:39.403: Tnl 20770 L2TP: O SCCCN to l2tp-gw tnlid 42921 Jan 1 00:33:39.403: Tnl 20770 L2TP: SM State established Jan 1 00:33:39.403: As1 VPDN: Forwarding... Jan 1 00:33:39.403: Tnl/Cl 20770/17 L2TP: Session FS enabled Jan 1 00:33:39.403: Tnl/Cl 20770/17 L2TP: Session state change from idle to wait-for-tunnel Jan 1 00:33:39.403: As1 Tnl/Cl 20770/17 L2TP: Create session Jan 1 00:33:39.403: Tnl 20770 L2TP: SM State established Jan 1 00:33:39.403: As1 Tnl/Cl 20770/17 L2TP: O ICRQ to l2tp-gw 42921/0 Jan 1 00:33:39.403: As1 Tnl/Cl 20770/17 L2TP: Session state change from wait-for-tunnel to wait-reply Jan 1 00:33:39.403: As1 VPDN: paul is forwarded Jan 1 00:33:39.407: As1 Tnl/Cl 20770/17 L2TP: O ICCN to l2tp-gw 42921/16 Jan 1 00:33:39.407: As1 Tnl/Cl 20770/17 L2TP: Session state change from wait-reply to established

[Аварийное переключение LNS Использование Cisco определяемые производителем характеристика пары значения /](#)

[Профиль RADIUS](#)

ПОЛЬЗОВАТЕЛЬ RADIUS и туннель представляют на Сервере Merit RADIUS 3.6B:

```
2500-1 Password = "cisco"  
Service-Type = Framed,  
Framed-Protocol = PPP,  
Framed-IP-Address = 255.255.255.255
```

```
dnis:614629 Password = "cisco"  
Service-Type = Outbound,  
Cisco:Avpair = "vpdn:tunnel-type=l2tp",  
Cisco:Avpair = "vpdn:tunnel-id=hgw",  
Cisco:Avpair = "vpdn:ip-addresses=10.51.6.82/10.51.6.59",  
Cisco:Avpair = "vpdn:l2tp-tunnel-password=hello"
```

[LAC и конфигурация LNS](#)

То же как предыдущий.

[Отладки, взятые от LAC](#)

```
Jan 1 02:00:35.767: As2 LCP: State is Open Jan 1 02:00:35.767: As2 PPP: Phase is AUTHENTICATING,  
by this end [0 sess, 0 load] Jan 1 02:00:35.767: As2 CHAP: Using alternate hostname 5300-1 Jan 1  
02:00:35.767: As2 CHAP: O CHALLENGE id 1 len 27 from "5300-1" Jan 1 02:00:35.959: As2 CHAP: I  
RESPONSE id 1 len 25 from "paul" Jan 1 02:00:35.959: As2 PPP: Phase is FORWARDING [0 sess, 0  
load] Jan 1 02:00:35.959: As2 VPDN: Got DNIS string 614629 Jan 1 02:00:35.959: As2 VPDN: Looking  
for tunnel -- dnis:614629 -- Jan 1 02:00:35.959: AAA/AUTHOR/VPDN: Async2 (3581154520)  
user='dnis:614629' Jan 1 02:00:35.963: Async2 AAA/AUTHOR/VPDN (3581154520): send AV service=ppp  
Jan 1 02:00:35.963: Async2 AAA/AUTHOR/VPDN (3581154520): send AV protocol=vpdn Jan 1  
02:00:35.963: Async2 AAA/AUTHOR/VPDN (3581154520): found list "default" Jan 1 02:00:35.963:  
Async2 AAA/AUTHOR/VPDN (3581154520): Method=NSA_LAB (radius) Jan 1 02:00:35.963: RADIUS: Initial  
Transmit Async2 id 56 10.51.6.3:1645, Access-Request, len 109 Jan 1 02:00:35.963: Attribute 4 6  
0A330644 Jan 1 02:00:35.963: Attribute 5 6 00000000 Jan 1 02:00:35.963: Attribute 26 14  
0000000902084173 Jan 1 02:00:35.963: Attribute 61 6 00000000 Jan 1 02:00:35.963: Attribute 1 13
```

646E6973 Jan 1 02:00:35.963: Attribute 30 8 36313436 Jan 1 02:00:35.963: Attribute 31 12
31363139 Jan 1 02:00:35.963: Attribute 2 18 2A5AF04C Jan 1 02:00:35.963: Attribute 6 6 00000005
Jan 1 02:00:35.967: RADIUS: Received from id 56 10.51.6.3:1645, Access-Accept, len 167 Jan 1
02:00:35.967: Attribute 6 6 00000005 Jan 1 02:00:35.967: Attribute 26 29 0000000901177670 Jan 1
02:00:35.967: Attribute 26 26 0000000901147670 Jan 1 02:00:35.967: Attribute 26 47
0000000901297670 Jan 1 02:00:35.967: Attribute 26 39 0000000901217670 Jan 1 02:00:35.967:
RADIUS: cisco AVPair "vpdn:tunnel-type=l2tp" Jan 1 02:00:35.967: RADIUS: cisco AVPair
"vpdn:tunnel-id=hgw" Jan 1 02:00:35.967: RADIUS: cisco AVPair "vpdn:ip-
addresses=10.51.6.82/10.51.6.59" Jan 1 02:00:35.967: RADIUS: cisco AVPair "vpdn:l2tp-tunnel-
password=hello" Jan 1 02:00:35.967: AAA/AUTHOR (3581154520): Post authorization status =
PASS_ADD Jan 1 02:00:35.967: AAA/AUTHOR/VPDN: Processing AV service=ppp Jan 1 02:00:35.967:
AAA/AUTHOR/VPDN: Processing AV protocol=vpdn Jan 1 02:00:35.967: AAA/AUTHOR/VPDN: Processing AV
tunnel-type=l2tp Jan 1 02:00:35.967: AAA/AUTHOR/VPDN: Processing AV tunnel-id=hgw Jan 1
02:00:35.967: AAA/AUTHOR/VPDN: Processing AV ip-addresses= 10.51.6.82/10.51.6.59 Jan 1
02:00:35.967: AAA/AUTHOR/VPDN: Processing AV l2tp-tunnel-password=hello *!--- LAC receives a
call, negotiates PPP, LCP is declared Open, !--- the dialed number is queried to ascertain if
this is a VPDN customer. !--- VPDN attempts to find an existing tunnel for the user, queries
RADIUS for !--- the tunnel information.* Jan 1 02:00:35.967: As2 VPDN/RPMS/: Got tunnel info for
dnis:614629 Jan 1 02:00:35.971: As2 VPDN/RPMS/: LAC hgw Jan 1 02:00:35.971: As2 VPDN/RPMS/:
l2tp-busy-disconnect yes Jan 1 02:00:35.971: As2 VPDN/RPMS/: l2tp-tunnel-password xxxxxx Jan 1
02:00:35.971: As2 VPDN/RPMS/: 2 IP addresses **Jan 1 02:00:35.971: As2 VPDN/RPMS/: IP 10.51.6.82
Priority 1 Jan 1 02:00:35.971: As2 VPDN/RPMS/: IP 10.51.6.59 Priority 2 Jan 1 02:00:35.971: As2
VPDN/: curlvl 1 Address 0: 10.51.6.82, priority 1 Jan 1 02:00:35.971: As2 VPDN/: Select non-
active address 10.51.6.82, priority 1 !--- The tunnel information is downloaded, using Cisco
VSA. !--- Two RADIUS server IP Address's are used with a '/' as the delimiter, !--- indicating
that there are two priority groups. In this case 10.51.6.82, !--- as Priority level 1, is
selected as the tunnel endpoint.** Jan 1 02:00:35.971: Tnl 17044 L2TP: SM State idle Jan 1
02:00:35.971: Tnl 17044 L2TP: O SCCRQ Jan 1 02:00:35.971: Tnl 17044 L2TP: Tunnel state change
from idle to wait-ctl-reply Jan 1 02:00:35.971: Tnl 17044 L2TP: SM State wait-ctl-reply Jan 1
02:00:35.971: As2 VPDN: Find LNS process created Jan 1 02:00:35.971: As2 VPDN: Forward to
address 10.51.6.82 Jan 1 02:00:35.971: As2 VPDN: Pending Jan 1 02:00:35.971: As2 VPDN: Process
created Jan 1 02:00:35.983: Tnl 17044 L2TP: I SCCRP from l2tp-gw Jan 1 02:00:35.983: Tnl 17044
L2TP: Got a challenge from remote peer, l2tp-gw Jan 1 02:00:35.983: Tnl 17044 L2TP: Got a
response from remote peer, l2tp-gw Jan 1 02:00:35.983: Tnl 17044 L2TP: Tunnel Authentication
success **Jan 1 02:00:35.983: Tnl 17044 L2TP: Tunnel state change from wait-ctl-reply to
established** Jan 1 02:00:35.983: Tnl 17044 L2TP: O SCCCN to l2tp-gw tnlid 9017 Jan 1
02:00:35.983: Tnl 17044 L2TP: SM State established Jan 1 02:00:35.983: As2 VPDN: Forwarding...
Jan 1 02:00:35.987: Tnl/Cl 17044/2 L2TP: Session FS enabled Jan 1 02:00:35.987: Tnl/Cl 17044/2
L2TP: Session state change from idle to wait-for-tunnel Jan 1 02:00:35.987: As2 Tnl/Cl 17044/2
L2TP: Create session Jan 1 02:00:35.987: Tnl 17044 L2TP: SM State established Jan 1
02:00:35.987: As2 Tnl/Cl 17044/2 L2TP: O ICRQ to l2tp-gw 9017/0 Jan 1 02:00:35.987: As2 Tnl/Cl
17044/2 L2TP: Session state change from wait-for-tunnel to wait-reply Jan 1 02:00:35.987: As2
VPDN: paul is forwarded Jan 1 02:00:35.995: As2 Tnl/Cl 17044/2 L2TP: O ICCN to l2tp-gw 9017/2
**Jan 1 02:00:35.995: As2 Tnl/Cl 17044/2 L2TP: Session state change from wait-reply to established
!--- The Tunnel and Session are now established. !--- A second call is received by the LAC. Jan
1 02:03:21.775: Se0:1 LCP: State is Open** Jan 1 02:03:21.775: Se0:1 PPP: Phase is AUTHENTICATING,
by this end [0 sess, 0 load] Jan 1 02:03:21.775: Se0:1 CHAP: Using alternate hostname 5300-1 Jan
1 02:03:21.775: Se0:1 CHAP: O CHALLENGE id 1 len 27 from "5300-1" Jan 1 02:03:21.799: Se0:1
CHAP: I RESPONSE id 1 len 27 from "2500-1" Jan 1 02:03:21.799: Se0:1 PPP: Phase is FORWARDING [0
sess, 0 load] **Jan 1 02:03:21.799: Se0:1 VPDN: Got DNIS string 614629 Jan 1 02:03:21.799: Se0:1
VPDN: Looking for tunnel -- dnis:614629 --** Jan 1 02:03:21.799: Serial0:1 AAA/AUTHOR/VPDN
(2106866192): Port='Serial0:1' list='default' service=NET Jan 1 02:03:21.799: AAA/AUTHOR/VPDN:
Serial0:1 (2106866192) user='dnis:614629' Jan 1 02:03:21.799: Serial0:1 AAA/AUTHOR/VPDN
(2106866192): send AV service=ppp Jan 1 02:03:21.799: Serial0:1 AAA/AUTHOR/VPDN (2106866192):
send AV protocol=vpdn Jan 1 02:03:21.799: Serial0:1 AAA/AUTHOR/VPDN (2106866192): found list
"default" Jan 1 02:03:21.799: Serial0:1 AAA/AUTHOR/VPDN (2106866192): Method=NSA_LAB (radius)
Jan 1 02:03:21.803: RADIUS: Initial Transmit Serial0:1 id 60 10.51.6.3:1645, Access-Request, len
112 Jan 1 02:03:21.803: Attribute 4 6 0A330644 Jan 1 02:03:21.803: Attribute 5 6 00000001 Jan 1
02:03:21.803: Attribute 26 17 00000009020B5365 Jan 1 02:03:21.803: Attribute 61 6 00000002 Jan 1
02:03:21.803: Attribute 1 13 646E6973 Jan 1 02:03:21.803: Attribute 30 8 36313436 Jan 1
02:03:21.803: Attribute 31 12 32303835 Jan 1 02:03:21.803: Attribute 2 18 1A511187 Jan 1
02:03:21.803: Attribute 6 6 00000005 Jan 1 02:03:21.803: RADIUS: Received from id 60
10.51.6.3:1645, Access-Accept, len 167 Jan 1 02:03:21.803: Attribute 6 6 00000005 Jan 1
02:03:21.803: Attribute 26 29 0000000901177670 Jan 1 02:03:21.803: Attribute 26 26

0000000901147670 Jan 1 02:03:21.803: Attribute 26 47 0000000901297670 Jan 1 02:03:21.803: Attribute 26 39 0000000901217670 Jan 1 02:03:21.807: RADIUS: cisco AVPair "vpdn:tunnel-type=l2tp" Jan 1 02:03:21.807: RADIUS: cisco AVPair "vpdn:tunnel-id=hgw" Jan 1 02:03:21.807: RADIUS: cisco AVPair "vpdn:ip-addresses=10.51.6.82/10.51.6.59" Jan 1 02:03:21.807: RADIUS: cisco AVPair "vpdn:l2tp-tunnel-password=hello" Jan 1 02:03:21.807: AAA/AUTHOR (2106866192): Post authorization status = PASS_ADD Jan 1 02:03:21.807: AAA/AUTHOR/VPDN: Processing AV service=ppp Jan 1 02:03:21.807: AAA/AUTHOR/VPDN: Processing AV protocol=vpdn Jan 1 02:03:21.807: AAA/AUTHOR/VPDN: Processing AV tunnel-type=l2tp Jan 1 02:03:21.807: AAA/AUTHOR/VPDN: Processing AV tunnel-id=hgw Jan 1 02:03:21.807: AAA/AUTHOR/VPDN: Processing AV ip-addresses=10.51.6.82/10.51.6.59 Jan 1 02:03:21.807: AAA/AUTHOR/VPDN: Processing AV l2tp-tunnel-password=hello Jan 1 02:03:21.807: Se0:1 VPDN/RPMS/: Got tunnel info for dnis:614629 Jan 1 02:03:21.807: Se0:1 VPDN/RPMS/: LAC hgw Jan 1 02:03:21.807: Se0:1 VPDN/RPMS/: l2tp-busy-disconnect yes Jan 1 02:03:21.807: Se0:1 VPDN/RPMS/: l2tp-tunnel-password xxxxxx Jan 1 02:03:21.807: Se0:1 VPDN/RPMS/: 2 IP addresses Jan 1 02:03:21.807: Se0:1 VPDN/RPMS/: IP 10.51.6.82 Priority 1 Jan 1 02:03:21.807: Se0:1 VPDN/RPMS/: IP 10.51.6.59 Priority 2 Jan 1 02:03:21.807: Se0:1 VPDN/: curlvl 1 Address 0: 10.51.6.82, priority 1 Jan 1 02:03:21.811: Se0:1 VPDN/: Select open address 10.51.6.82, priority 1 Jan 1 02:03:21.811: Se0:1 VPDN: Forward to address 10.51.6.82 !--- The tunnel information is downloaded, LNS - 10.51.6.82 is !--- selected again as the tunnel endpoint as this is in Priority level 1. Jan 1 02:03:21.811: Se0:1 VPDN: Forwarding... Jan 1 02:03:21.811: Tnl/Cl 17044/3 L2TP: Session state change from idle to wait-for-tunnel Jan 1 02:03:21.811: Se0:1 Tnl/Cl 17044/3 L2TP: Create session Jan 1 02:03:21.811: Tnl 17044 L2TP: SM State established Jan 1 02:03:21.811: Se0:1 Tnl/Cl 17044/3 L2TP: O ICRQ to l2tp-gw 9017/0 Jan 1 02:03:21.811: Se0:1 Tnl/Cl 17044/3 L2TP: Session state change from wait-for-tunnel to wait-reply Jan 1 02:03:21.811: Se0:1 VPDN: 2500-1 is forwarded Jan 1 02:03:21.819: Se0:1 Tnl/Cl 17044/3 L2TP: O ICCN to l2tp-gw 9017/3 Jan 1 02:03:21.819: Se0:1 Tnl/Cl 17044/3 L2TP: Session state change from wait-reply to established

[Распределение нагрузки LNS и использование Аварийного переключения Cisco Определяемые производителем характеристика Пары Значения /](#)

[Профиль RADIUS](#)

ПОЛЬЗОВАТЕЛЬ RADIUS и туннель представляют на Сервере Merit RADIUS 3.6B:

```
2500-1 Password = "cisco"
Service-Type = Framed,
Framed-Protocol = PPP,
Framed-IP-Address = 255.255.255.255
dnis:614629 Password = "cisco"
Service-Type = Outbound,
Cisco:Avpair = "vpdn:tunnel-type=l2tp",
Cisco:Avpair = "vpdn:tunnel-id=hgw",
Cisco:Avpair = "vpdn:ip-addresses=
10.51.6.80,10.51.6.59/10.51.6.2,10.51.6.3/10.51.6.82,10.51.6.5",
Cisco:Avpair = "vpdn:l2tp-tunnel-password=hello"
```

[LAC и конфигурация LNS](#)

То же как предыдущий.

[Отладки, взятые от LAC](#)

Jan 1 00:43:11.539: %LINK-3-UPDOWN: Interface Serial0:0, changed state to up

```
Jan 1 00:43:11.755: Se0:0 LCP: State is Open Jan 1 00:43:11.755: Se0:0 PPP: Phase is
AUTHENTICATING, by this end Jan 1 00:43:11.755: Se0:0 CHAP: Using alternate hostname 5300-1 Jan
1 00:43:11.755: Se0:0 CHAP: O CHALLENGE id 18 len 27 from "5300-1" Jan 1 00:43:11.775: Se0:0
CHAP: I RESPONSE id 18 len 27 from "2500-1" Jan 1 00:43:11.775: Se0:0 PPP: Phase is FORWARDING
Jan 1 00:43:11.775: Se0:0 VPDN: Got DNIS string 614629 Jan 1 00:43:11.775: Se0:0 VPDN: Looking
for tunnel -- dnis:614629 -- Jan 1 00:43:11.775: Serial0:0 AAA/AUTHOR/VPDN (2215378044):
```


Port='Serial0:0' list='default' service=NET Jan 1 00:43:11.775: AAA/AUTHOR/VPDN: Serial0:0 (2215378044) user='dnis:614629' Jan 1 00:43:11.775: Serial0:0 AAA/AUTHOR/VPDN (2215378044): send AV service=ppp Jan 1 00:43:11.775: Serial0:0 AAA/AUTHOR/VPDN (2215378044): send AV protocol=vpdn Jan 1 00:43:11.775: Serial0:0 AAA/AUTHOR/VPDN (2215378044): found list "default" Jan 1 00:43:11.775: Serial0:0 AAA/AUTHOR/VPDN (2215378044): Method=NSA_LAB (radius) Jan 1 00:43:11.779: RADIUS: Initial Transmit Serial0:0 id 57 10.51.6.3:1645, Access-Request, len 112 Jan 1 00:43:11.779: Attribute 4 6 0A330644 Jan 1 00:43:11.779: Attribute 5 6 00000000 Jan 1 00:43:11.779: Attribute 26 17 00000009020B5365 Jan 1 00:43:11.779: Attribute 61 6 00000002 Jan 1 00:43:11.779: Attribute 1 13 646E6973 Jan 1 00:43:11.779: Attribute 30 8 36313436 Jan 1 00:43:11.779: Attribute 31 12 32303835 Jan 1 00:43:11.779: Attribute 2 18 BA50FCD1 Jan 1 00:43:11.779: Attribute 6 6 00000005 Jan 1 00:43:11.783: RADIUS: Received from id 57 10.51.6.3:1645, Access-Accept, len 208 Jan 1 00:43:11.783: Attribute 6 6 00000005 Jan 1 00:43:11.783: Attribute 26 29 0000000901177670 Jan 1 00:43:11.783: Attribute 26 26 0000000901147670 Jan 1 00:43:11.783: Attribute 26 88 0000000901527670 Jan 1 00:43:11.783: Attribute 26 39 0000000901217670 Jan 1 00:43:11.783: RADIUS: cisco AVPair "vpdn:tunnel-type=l2tp" Jan 1 00:43:11.783: RADIUS: cisco AVPair "vpdn:tunnel-id=hgw" Jan 1 00:43:11.783: RADIUS: cisco AVPair "vpdn:ip-addresses=10.51.6.80,10.51.6.59/10.51.6.2,10.51.6.3/10.51.6.82,10.51.6.5" Jan 1 00:43:11.783: RADIUS: cisco AVPair "vpdn:l2tp-tunnel-password=hello" Jan 1 00:43:11.783: AAA/AUTHOR (2215378044): Post authorization status = PASS_ADD Jan 1 00:43:11.783: AAA/AUTHOR/VPDN: Processing AV service=ppp Jan 1 00:43:11.783: AAA/AUTHOR/VPDN: Processing AV protocol=vpdn Jan 1 00:43:11.783: AAA/AUTHOR/VPDN: Processing AV tunnel-type=l2tp Jan 1 00:43:11.783: AAA/AUTHOR/VPDN: Processing AV tunnel-id=hgw Jan 1 00:43:11.783: AAA/AUTHOR/VPDN: Processing AV ip-addresses=10.51.6.80,10.51.6.59/10.51.6.2,10.51.6.3/10.51.6.82,10.51.6.5 Jan 1 00:43:11.783: AAA/AUTHOR/VPDN: Processing AV l2tp-tunnel-password=hello Jan 1 00:43:11.783: Se0:0 VPDN/RPMS/: Got tunnel info for dnis:614629 Jan 1 00:43:11.783: Se0:0 VPDN/RPMS/: LAC hgw Jan 1 00:43:11.787: Se0:0 VPDN/RPMS/: l2tp-busy-disconnect yes Jan 1 00:43:11.787: Se0:0 VPDN/RPMS/: l2tp-tunnel-password xxxxxx Jan 1 00:43:11.787: Se0:0 VPDN/RPMS/: 6 IP addresses **Jan 1 00:43:11.787: Se0:0 VPDN/RPMS/: IP 10.51.6.80 Priority 1 Jan 1 00:43:11.787: Se0:0 VPDN/RPMS/: IP 10.51.6.59 Priority 1 Jan 1 00:43:11.787: Se0:0 VPDN/RPMS/: IP 10.51.6.2 Priority 2 Jan 1 00:43:11.787: Se0:0 VPDN/RPMS/: IP 10.51.6.3 Priority 2 Jan 1 00:43:11.787: Se0:0 VPDN/RPMS/: IP 10.51.6.82 Priority 3 Jan 1 00:43:11.787: Se0:0 VPDN/RPMS/: IP 10.51.6.5 Priority 3 !---** *The tunnel information is downloaded, using Cisco VSA. Two RADIUS !---* *server IP Addresses are used with a '/' as the delimiter for each !---* *of the three priority groups. In this case, 10.51.6.82 in Priority !---* *Group 3, is the tunnel endpoint that is valid.* Jan 1 00:43:11.787: Se0:0 VPDN/: curlvl 1 Address 1: 10.51.6.59, priority 1 Jan 1 00:43:11.787: VPDN: Free busy address 10.51.6.59 **Jan 1 00:43:11.787: Se0:0 VPDN/: Select non-active address 10.51.6.59, priority 1** Jan 1 00:43:11.787: Se0:0 VPDN: Find LNS process created Jan 1 00:43:11.787: Tnl 8262 L2TP: SM State idle **Jan 1 00:43:11.787: Tnl 8262 L2TP: O SCCRQ** Jan 1 00:43:11.787: Tnl 8262 L2TP: Tunnel state change from idle to wait-ctl-reply Jan 1 00:43:11.787: Tnl 8262 L2TP: SM State wait-ctl-reply Jan 1 00:43:11.787: Se0:0 VPDN: Forward to address 10.51.6.59 Jan 1 00:43:11.791: Se0:0 VPDN: Pending Jan 1 00:43:11.791: Se0:0 VPDN: Process created **Jan 1 00:43:12.787: Tnl 8262 L2TP: O Resend SCCRQ, flg TLS, ver 2, len 128, tnl 0, cl 0, ns 0, nr 0** Jan 1 00:43:12.787: Tnl 8262 L2TP: Control channel retransmit delay set to 1 seconds **Jan 1 00:43:13.787: Tnl 8262 L2TP: O Resend SCCRQ, flg TLS, ver 2, len 128, tnl 0, cl 0, ns 0, nr 0** Jan 1 00:43:13.787: Tnl 8262 L2TP: Control channel retransmit delay set to 2 seconds **Jan 1 00:43:15.787: Tnl 8262 L2TP: Timeout opening tunnel to 10.51.6.59** Jan 1 00:43:15.787: Tnl 63291 L2TP: Control channel retransmit delay set to 4 seconds **Jan 1 00:43:15.787: Se0:0 VPDN/: curlvl 1 Address 1: 10.51.6.59, priority 1 busy !---** *10.51.6.59 is selected as the first non-active IP Address in Priority !---* *Group 1. As we cannot establish the Control Connection after the !---* *4 second SCCRQ timeout, we select the next non-active IP !---* *Address in the same Priority Group.* Jan 1 00:43:15.787: Se0:0 VPDN/: curlvl 1 Address 0: 10.51.6.80, priority 1 Jan 1 00:43:15.787: VPDN: Free busy address 10.51.6.80 **Jan 1 00:43:15.787: Se0:0 VPDN/: Select non-active address 10.51.6.80, priority 1** Jan 1 00:43:15.787: Tnl 63291 L2TP: Tunnel state change from wait-ctl-reply to idle Jan 1 00:43:15.787: Tnl 63291 L2TP: SM State idle Jan 1 00:43:15.787: Tnl 63291 L2TP: O SCCRQ Jan 1 00:43:15.787: Tnl 63291 L2TP: Tunnel state change from idle to wait-ctl-reply Jan 1 00:43:15.787: Tnl 63291 L2TP: SM State wait-ctl-reply Jan 1 00:43:16.787: Tnl 63291 L2TP: O Resend SCCRQ, flg TLS, ver 2, len 128, tnl 0, cl 0, ns 0, nr 0 Jan 1 00:43:16.787: Tnl 63291 L2TP: Control channel retransmit delay set to 1 seconds Jan 1 00:43:17.543: %ISDN-6-CONNECT: Interface Serial0:0 is now connected to 2085730592 Jan 1 00:43:17.787: Tnl 63291 L2TP: O Resend SCCRQ, flg TLS, ver 2, len 128, tnl 0, cl 0, ns 0, nr 0 Jan 1 00:43:17.787: Tnl 63291 L2TP: Control channel retransmit delay set to 2 seconds Jan 1 00:43:19.787: Tnl 63291 L2TP: Timeout opening tunnel to 10.51.6.80 Jan 1 00:43:19.787: Tnl 52784 L2TP: Control channel retransmit delay set to 4 seconds Jan 1 00:43:19.787: Se0:0 VPDN/: curlvl 1 Address 0:

10.51.6.80, priority 1 busy Jan 1 00:43:19.787: Se0:0 VPDN/: curlvl 1 Address 1: 10.51.6.59, priority 1 busy Jan 1 00:43:19.787: Se0:0 VPDN/: curlvl 2 Address 2: 10.51.6.2, priority 2 Jan 1 00:43:19.787: VPDN: Free busy address 10.51.6.2 **Jan 1 00:43:19.787: Se0:0 VPDN/: Select non-active address 10.51.6.2, priority 2** Jan 1 00:43:19.787: Tnl 52784 L2TP: Tunnel state change from wait-ctl-reply to idle Jan 1 00:43:19.787: Tnl 52784 L2TP: SM State idle Jan 1 00:43:19.787: Tnl 52784 L2TP: O SCCRQ Jan 1 00:43:19.787: Tnl 52784 L2TP: Tunnel state change from idle to wait-ctl-reply Jan 1 00:43:19.787: Tnl 52784 L2TP: SM State wait-ctl-reply Jan 1 00:43:20.787: Tnl 52784 L2TP: O Resend SCCRQ, flg TLS, ver 2, len 128, tnl 0, cl 0, ns 0, nr 0 Jan 1 00:43:20.787: Tnl 52784 L2TP: Control channel retransmit delay set to 1 seconds Jan 1 00:43:21.671: Se0:0 CHAP: I RESPONSE id 18 len 27 from "2500-1" Jan 1 00:43:21.671: Se0:0 VPDN: LCP state already FORWARDING/FORWARDED, silent discard Jan 1 00:43:21.787: Tnl 52784 L2TP: O Resend SCCRQ, flg TLS, ver 2, len 128, tnl 0, cl 0, ns 0, nr 0 Jan 1 00:43:21.787: Tnl 52784 L2TP: Control channel retransmit delay set to 2 seconds Jan 1 00:43:23.787: Tnl 52784 L2TP: Timeout opening tunnel to 10.51.6.2 Jan 1 00:43:23.787: Tnl 42277 L2TP: Control channel retransmit delay set to 4 seconds Jan 1 00:43:23.787: Se0:0 VPDN/: curlvl 2 Address 2: 10.51.6.2, priority 2 busy Jan 1 00:43:23.787: Se0:0 VPDN/: curlvl 2 Address 3: 10.51.6.3, priority 2 Jan 1 00:43:23.787: VPDN: Free busy address 10.51.6.3 **Jan 1 00:43:23.787: Se0:0 VPDN/: Select non-active address 10.51.6.3, priority 2** Jan 1 00:43:23.787: Tnl 42277 L2TP: Tunnel state change from wait-ctl-reply to idle Jan 1 00:43:23.787: Tnl 42277 L2TP: SM State idle Jan 1 00:43:23.787: Tnl 42277 L2TP: O SCCRQ Jan 1 00:43:23.787: Tnl 42277 L2TP: Tunnel state change from idle to wait-ctl-reply Jan 1 00:43:23.787: Tnl 42277 L2TP: SM State wait-ctl-reply Jan 1 00:43:24.787: Tnl 42277 L2TP: O Resend SCCRQ, flg TLS, ver 2, len 128, tnl 0, cl 0, ns 0, nr 0 Jan 1 00:43:24.787: Tnl 42277 L2TP: Control channel retransmit delay set to 1 seconds Jan 1 00:43:25.787: Tnl 42277 L2TP: O Resend SCCRQ, flg TLS, ver 2, len 128, tnl 0, cl 0, ns 0, nr 0 Jan 1 00:43:25.787: Tnl 42277 L2TP: Control channel retransmit delay set to 2 seconds Jan 1 00:43:27.787: Tnl 42277 L2TP: Timeout opening tunnel to 10.51.6.3 Jan 1 00:43:27.787: Tnl 31770 L2TP: Control channel retransmit delay set to 4 seconds Jan 1 00:43:27.787: Se0:0 VPDN/: curlvl 2 Address 3: 10.51.6.3, priority 2 busy Jan 1 00:43:27.787: Se0:0 VPDN/: curlvl 2 Address 2: 10.51.6.2, priority 2 busy Jan 1 00:43:27.787: Se0:0 VPDN/: curlvl 3 Address 4: 10.51.6.82, priority 3 **Jan 1 00:43:27.787: Se0:0 VPDN/: Select non-active address 10.51.6.82, priority 3 !--- Eventually arrive at the IP Address 10.51.6.82 in Priority Group 3. !--- As this is valid, the Control Connection and session are established.** Jan 1 00:43:27.787: Tnl 31770 L2TP: Tunnel state change from wait-ctl-reply to idle Jan 1 00:43:27.787: Tnl 31770 L2TP: SM State idle Jan 1 00:43:27.787: Tnl 31770 L2TP: O SCCRQ Jan 1 00:43:27.787: Tnl 31770 L2TP: Tunnel state change from idle to wait-ctl-reply Jan 1 00:43:27.787: Tnl 31770 L2TP: SM State wait-ctl-reply Jan 1 00:43:27.799: Tnl 31770 L2TP: I SCCRP from l2tp-gw Jan 1 00:43:27.799: Tnl 31770 L2TP: Got a challenge from remote peer, l2tp-gw Jan 1 00:43:27.799: Tnl 31770 L2TP: Got a response from remote peer, l2tp-gw Jan 1 00:43:27.799: Tnl 31770 L2TP: Tunnel Authentication success **Jan 1 00:43:27.799: Tnl 31770 L2TP: Tunnel state change from wait-ctl-reply to established** Jan 1 00:43:27.799: Tnl 31770 L2TP: O SCCCN to l2tp-gw tnlid 3843 Jan 1 00:43:27.799: Tnl 31770 L2TP: SM State established Jan 1 00:43:27.799: Se0:0 VPDN: Forwarding... Jan 1 00:43:27.799: Tnl/Cl 31770/7 L2TP: Session FS enabled Jan 1 00:43:27.799: Tnl/Cl 31770/7 L2TP: Session state change from idle to wait-for-tunnel Jan 1 00:43:27.803: Se0:0 Tnl/Cl 31770/7 L2TP: Create session Jan 1 00:43:27.803: Tnl 31770 L2TP: SM State established Jan 1 00:43:27.803: Se0:0 Tnl/Cl 31770/7 L2TP: O ICRQ to l2tp-gw 3843/0 Jan 1 00:43:27.803: Se0:0 Tnl/Cl 31770/7 L2TP: Session state change from wait-for-tunnel to wait-reply Jan 1 00:43:27.803: Se0:0 VPDN: 2500-1 is forwarded Jan 1 00:43:27.811: Se0:0 Tnl/Cl 31770/7 L2TP: O ICCN to l2tp-gw 3843/9 **Jan 1 00:43:27.811: Se0:0 Tnl/Cl 31770/7 L2TP: Session state change from wait-reply to established** Jan 1 00:43:28.803: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0:0, changed state to up

[Дополнительные сведения](#)

- [RADIUS Tunnel Preference for Load Balancing and Fail-over \(L2TP\)](#)
- [Cisco Systems – техническая поддержка и документация](#)