

ASR1K في Xconnect over VRF Aware L2TPv3

تايوت حمل

—

[تم دق م ل ا](#)

[ة ي س ا س ا ت ا م و ل ع م](#)

[VRF في ة ي ا ه ن ل ا ط ا ق ن ع م IP ة ك ب ش ر ب ع L2TPv3 Xconnect : ل و ا ل ا ر ا ب ت خ ا ل ا ة ل ا ح](#)

[ط ا ق ن م ا د خ ت س ا ب MPLS ة ك ب ش ر ب ع L2TPv3 Xconnect : ة ي ا ه ن ل ا ر ا ب ت خ ا ل ا ة ل ا ح](#)
[VRF في ة ي ا ه ن ل ا](#)

تم دق م ل ا

ن ي و ك ت د ن ع (VRF) ه ي ج و ت ل ا ة د ا ع ا و ي ر ه ا ط ل ا ه ي ج و ت ل ا م ا د خ ت س ا ة ي ف ي ك د ن ت س م ل ا ا ذ ه ف ص ي
R ب ع IP ر ب ع (L2TP)V3 Xconnect 2 ة ق ب ط ل ا ق ف ن ل و ك و ت و ر ب ر ب ع (MPLS) ة ي م س ت ل ل ل ي و ح ت ة ك ب ش
(MPLS) ت ا ل و ك و ت و ر ب ل د د ع ت م ة ي م س ت ل ل ل ي و ح ت ة ك ب ش و

ة ي س ا س ا ت ا م و ل ع م

ل ر ي ف و ت ل (ISPs) ت ن ر ت ن ا ل ا ة م د خ و ر ف و م ه م د خ ت س ي ي ذ ل ا ي ق ف ن ل ا ل ا ص ت ا ل ل و ك و ت و ر ب و ه L2TP
ت ن ر ت ن ا ل ا ر ب ع ب ل ط ل ا ل ا ل و ص و ل ا ة ح ا س م ي ف (VPN) ة ي ر ه ا ط ل ا ة ص ا خ ل ا ة ك ب ش ل ا

ل ا ص ت ا ل ل و ك و ت و ر ب و Cisco ن م (L2F) 2 ة ق ب ط ل ا ه ي ج و ت ة د ا ع ا ل و ك و ت و ر ب ل ض ف ا ن ي ب ع م ج ي و ه و
ة د ح و ي ه L2TP ل ة ي س ي ئ ر ل ا ت ا ن و ك م ل ا Microsoft. ن م (PPTP) ة ط ق ن ل ا ة ط ق ن ن م ي ق ف ن ل ا
(LNS) L2TP ة ك ب ش م د ا خ و (LAC) L2TP ل ا ل و ص و ل ا ي ف م ك ح ت ل ا

ة م ا ع ة ل و ح م ف ت ا ه ة ك ب ش ب ل ص ت م ل و ص و م د ا خ و ه L2TP: LAC ل ا ل و ص و ل ا ي ف م ك ح ت ل ا ة د ح و
R ب ع LNS ب ل ص ت م و ه و . ة ر د ا ص ل ا ت ا م ل ا ك م ل ا ي ق ل ت م و ة د ر ا و ل ا ت ا م ل ا ك م ل ا ئ د ا ب و ه LAC. (PSTN)
WAN ة ك ب ش و ا (LAN) ة ي ل ح م ل ا ة ك ب ش ل ا

م ت ي و PPP ت ا س ل ج ي ه ت ن ت ث ي ح L2TP ل و ك و ت و ر ب ل ة ك ب ش ل ا م د ا خ و ه LNS: L2TP ة ك ب ش م د ا خ
ة د ر ا و ل ا ت ا م ل ا ك م ل ا ي ق ل ت م و ة ر د ا ص ل ا ت ا م ل ا ك م ل ا ئ د ا ب و ه LNS. ا ه ت ق د ا ص م

ة ك ب ش ل ا ل ا ل و ص و ل ا ة ز ه ج ا ت م ا ق . IP ت ا ك ب ش ر ب ع PPP ر و ر م ة ك ر ح ل م ح ل L2TPv2 م ي م ص ت م ت
ن م PPP ت ا ل ا ص ت ا ل و ب ق ب (ي ف ت ا ه ل ا ب ل ط ل ا ل ا ل و ص و ل ا ت ا ه ج ا و ا ل ب ك ل ا م د و م و ا DSL)
ي د ج ل ا ر ا د ص ل ا م ي م ص ت م ت . L2TP R ب ع ISP ل ا ل PPP ت ا س ل ج ل ت ا و ن ق ع ا ش ن ا و ن ي ك ر ت ش م ل ا
ي ت ل ا ة د ي ح و ل ا ة ل و م ح ل ا ت ن ا ك ي ت ل ا PPP ل ا ة ف ا ض ا ل ا ب 2 ة ق ب ط ل ا ن م ة ل و م ح ي ا ل م ح ل L2TPv3
R ب ع ي ق ف ن ل ا 2 ة ق ب ط ل ا ت ا ل و م ح ل L2TP ل و ك و ت و ر ب ا د ي د ح ت L2TPv3 د د ح ي . 2 ر ا د ص ل ا ب ا ه م ع د م ت
ا م ة ز ي م ل ا ه ذ ه د ئ ا و ف ن م ص ت ت . 2 ة ق ب ط ل ا ن م VPN ت ا ك ب ش م ا د خ ت س ا ع م ة ي س ا س ا ل ا IP ة ك ب ش
ي ل ي :

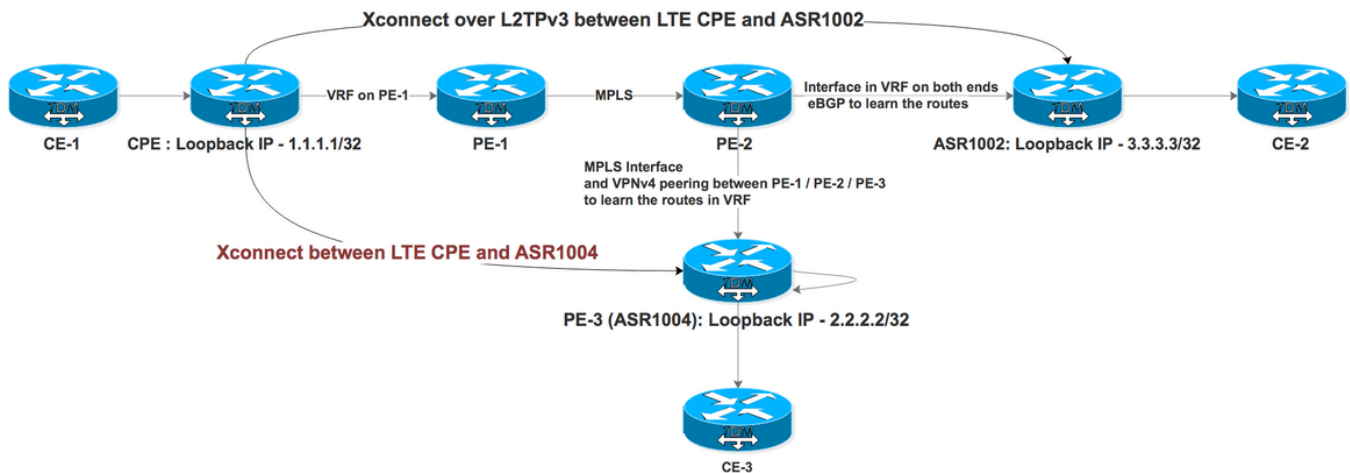
- VPN ت ا ك ب ش ر ش ن ط س ب ي L2TPv3
- MPLS ب ل ط ت ي ل L2TPv3

- ةلومح يأل IP ربع 2 ةقبطلل يققننل لاصتال L2TPv3 معددي

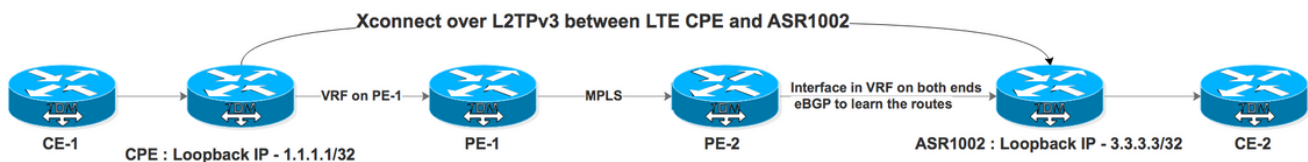
يلصلأل L2TPv3 نيوكت جذومن يلي اميفو:

1. enable
2. configure يف رط زاهج
3. interface عوننل ذفنم/ةحتف
4. xconnect ةلسبك ةيلمع ريظننل ناوعب صاخأل (VCID) درومل ةئف فرعم class-name

يلي اميف VRF مادختسا دنع L2TPv3 Xconnect فرصت ةيفيك يلع ةرطن قلأ، نأل CPE و Xconnect نيوكت هيف مت يذل حيصوتلل اهمادختسا متي يتال ايجولوبطال VRF ي ASR1000 ف ةياهنل طاقن عم (MPLS) ASR1004 (IP) و ASR1002 (L2TPv3 معد متي ال). (ASR1000 ةصنم يلع



طاقن عم IP ةكبش ربع L2TPv3 Xconnect: يأل رابتخال ةلاح VRF ف ةياهنل



امك، VRF ربع PE-1 ب CPE لصتت. ISP ل MPLS ةكبش عاشنل يلع PE-2 و PE-1 نم لك لمعي ب ةلصتلمل ةهجالو يلع VRF يلع اضيأ ASR1002 يوتحي. VRF ربع PE-2 ب ASR1002 لصتت IP. ةهجاو ربع VRF ربع ASR1002 نم CPE عاجرتسا يلا لوصولا نكمي. PE-2.

ASR1002 وحن Xconnect ل CPE يلع نيوكتال:


```
ip address 10.1.1.1 255.255.255.252
```

```
interface GigabitEthernet0/0/1.2381
```

```
encapsulation dot1Q 2381
```

```
xconnect 1.1.1.1 2381 encapsulation l2tpv3 pw-class PSEUDO_CLASS
```

```
pseudowire-class PSEUDO_CLASS
```

```
encapsulation l2tpv3
```

```
interworking vlan
```

```
protocol l2tpv3 L2TP_CLASS
```

```
ip local interface Loopback11
```

```
l2tp-class L2TP_CLASS
```

```
authentication
```

```
password cisco
```

```
interface Loopback11
```

```
ip vrf forwarding L2TP_VRF -----> Source is in VRF
```

```
ip address 3.3.3.3 255.255.255.255
```

```
router bgp 1
```

```
address-family ipv4 vrf L2TP_VRF
```

```
redistribute connected
```

```
neighbor 10.1.1.2 remote-as 2 -----> eBGP with PE-2 in VRF
```

```
neighbor 10.1.1.2 activate
```

```
neighbor 10.1.1.2 soft-reconfiguration inbound
```

```
exit-address-family
```

```
VRF L2TP_VRF:
```

```
B      1.1.1.1/32 [20/0] via 10.1.1.2, 1d -----> Xconnect end point learned via eBGP in VRF
```

CPE: Xconnect ةلا ح نم ققحتلا نآلا انعد

<#root>

```
CPE #sh xconnect all de
```

Legend: XC ST=Xconnect State S1=Segment1 State S2=Segment2 State

UP=Up DN=Down AD=Admin Down IA=Inactive

SB=Standby HS=Hot Standby RV=Recovering NH=No Hardware

XC	ST	Segment 1	S1	Segment 2	S2
----	----	-----------	----	-----------	----

```
UP pri      ac Fa4.2381:2381(Eth VLAN)      UP 12tp 3.3.3.3:2381
```

DOWN

Interworking: vlan

Session ID: 1906980494

Tunnel ID: 2886222725

Protocol State: DOWN

Remote Circuit State: DOWN

pw-class: PSEUDO_CLASS_VLAN

عمو. ٤لكشم هجاوي ASR1002 الى CPE نم راسم ال نأ ينعي امم ، لطمع م 2 عزال نإ لوقي امك
 ةطقن الى قفنل نأ CPE الى يحيصتلا رهظت . ةياهنلا ةطقن لاصتا رابتخا اننكمي ، كذا
 ةياهنلا ةطقن الى راسم دجوي ال وأ لشف ةياهنلا .

```
*Feb 15 08:12:47.225: L2TP ____:18136:8DF92CB9/uid:0[1.1.1.1/2381]: I CDN, flg TLS, ver 3, len 80
```

```
*Feb 15 08:12:47.225: L2TP ____:18136:8DF92CB9/uid:0[1.1.1.1/2381]:IETF v2:
```

```
*Feb 15 08:12:47.225: L2TP ____:18136:8DF92CB9/uid:0[1.1.1.1/2381]:Result Code
```

```
*Feb 15 08:12:47.225: L2TP ____:18136:8DF92CB9/uid:0[1.1.1.1/2381]: Call disconnected for administra
```

```
*Feb 15 08:12:47.225: L2TP ____:18136:8DF92CB9/uid:0[1.1.1.1/2381]: Error code
*Feb 15 08:12:47.225: L2TP ____:18136:8DF92CB9/uid:0[1.1.1.1/2381]: No error(0)
*Feb 15 08:12:47.225: L2TP ____:18136:8DF92CB9/uid:0[1.1.1.1/2381]: Optional msg
*Feb 15 08:12:47.225: L2TP ____:18136:8DF92CB9/uid:0[1.1.1.1/2381]: "Tunnel failed to 3.3.3.3" >
*Feb 15 08:12:47.225: L2TP ____:18136:8DF92CB9/uid:0[1.1.1.1/2381]:Cisco v3:
```

ASR1002 ىل ع VRF ربع اهيل لوصول نكمي ةياهن لاطقن نأ يه انه ةيسيئرل اكلشم ل نآل مقنل ف. رهظت ىتح ماعل اهجوتل لودج في Xconnect ةياهن لاطقن نوكت نأ مزلي GigabitEthernet0/0/0.906 هجاو ىل ريشي ماع في CPE Loopback 1.1.1.1/32 ل راسم نيوكتب VRF في اهسفن يه يتلاو.

<#root>

```
ip route 1.1.1.1 255.255.255.255 GigabitEthernet0/0/0.906 10.1.1.2
```

```
S 1.1.1.1/32 [1/0] via 10.1.1.2, GigabitEthernet0/0/0.906
```

Null0 ىل اهيل لةراش لاضيا كنكمي Xconnect. رهظي، فئازل تباثل راسم ل نيوكتب درجمب Global ربع اهيل لوصول نكمي ةياهن لاطقن نأ دقتعي ناب هجوملل خامسلل لي دب ل اذه تانايل يوتسم رورم ةكرح نوكتس. مكحتل يوتسم ل طقف اهم ادختسا متي و VRF سيلو طقف VRF ربع يلعلل.

نونودو (VRF) يكلسالل ددرتل عم لاصتال رابتخا جئاتن يلي امي ف:

```
ASR1002 #ping 1.1.1.1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds:
```

```
.....
```

```
Success rate is 0 percent (0/5)
```

```
Ping vrf L2TP_VRF 1.1.1.1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 1.1.1.1, timeout is 2 seconds:
```

```
!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 33/50/72 ms
```

<#root>

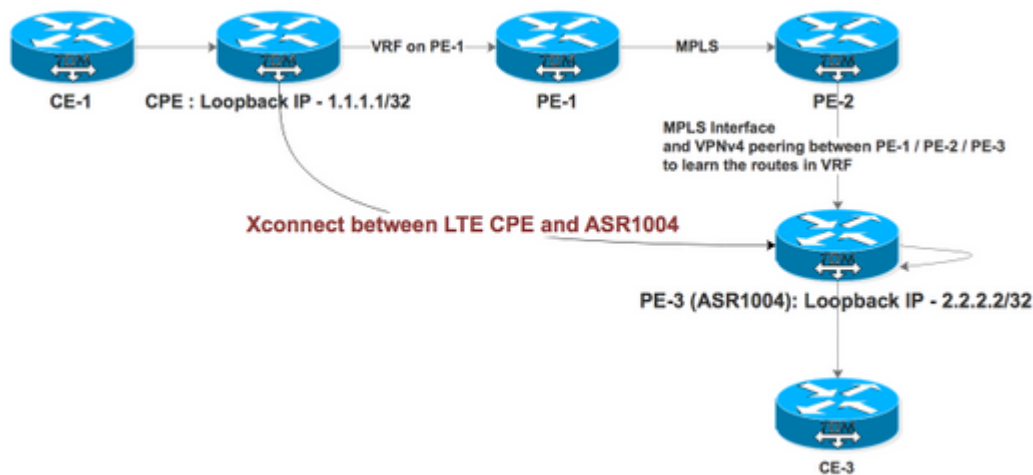
Legend:	XC ST=Xconnect State	S1=Segment1 State	S2=Segment2 State
UP=Up	DN=Down	AD=Admin Down	IA=Inactive
SB=Standby	HS=Hot Standby	RV=Recovering	NH=No Hardware

-----+-----+-----+-----

Interworking: vlan

pw-class: PSEUDO_CLASS_VLAN

MPLS كُبة ش ربع L2TPv3 Xconnect :ةيناثلا رابتخال ةلاح VRF في ةياهنلا طاقن مادختساب



سكاعك PE-2 م ادخات س اب ISP ل MPLS ةكبش ل ع ج ل ع PE-1 و PE-2 و PE-3 نم لك لم ع ي ل ع MPLS ني كم ت عم PE-2 ب لص ت م ASR1004 و VRF رب ع PE-1 ب لص ت م CPE. راس م ل ل ه ي ف ل ب ق ت س ي ن ا ض ر ت ف م ل ن م ي ذ ل ا (VRF) و ي دار ل ا د ر ت ل ع ASR1004 ي و ت ح ي ام ك . ة ه ج ا و ل ا VRF رب ع ASR1004 نم CPE ل ا ص ت ا ط خ ل ل ا ل و ص و ل ا ن ك م ي . RR رب ع PE-1 نم VPNv4 ت ا ر ا س م MPLS. ة ه ج ا و ر ب ع

ASR1004: وحن Xconnect ل CPE ل ع ني و ك ت ل ا

```
interface FastEthernet4.2380
encapsulation dot1Q 2380
xconnect 2.2.2.2 2380 encapsulation l2tpv3 pw-class PSEUDO_CLASS >>>>>>>>>Xconnect with ASR1004

interface FastEthernet4.2381
encapsulation dot1Q 2381
xconnect 3.3.3.3 2381 encapsulation l2tpv3 pw-class PSEUDO_CLASS >>>>>>>>> Xconnect with ASR1002

pseudowire-class PSEUDO_CLASS
encapsulation l2tpv3
interworking vlan
protocol l2tpv3 L2TP_CLASS
ip local interface Loopback0
ip tos reflect
```

```
l2tp-class L2TP_CLASS
```

```
authentication
```

```
password cisco
```

```
interface Gigabit0/1
```

```
ip address 192.168.8.190 255.255.255.0
```

```
end
```

```
Interface Loopback0
```

```
ip address 1.1.1.1 255.255.255.255
```

```
end
```

```
ip route 0.0.0.0 0.0.0.0 192.168.8.1 >>>>>>>>>>>>>>> Default route towards PE-1
```

ASR1004: ىلع نيوكتلا

```
interface GigabitEthernet0/0/1
```

```
no ip address
```

```
negotiation auto
```

```
service instance 2 ethernet
```

```
encapsulation dot1q 2380
```

```
xconnect 1.1.1.1 2380 encapsulation l2tpv3 pw-class PSEUDO_CLASS_VLAN
```

```
!
```

```
end
```

```
interface Loopback11
```

```
ip vrf forwarding L2TP_VRF -----> Source Loopback in in VRF
```

```
ip address 2.2.2.2 255.255.255.255
```

```
end
```

```
pseudowire-class PSEUDO_CLASS_VLAN
```

```
encapsulation l2tpv3

interworking vlan

protocol l2tpv3 L2TP_CLASS

ip local interface Loopback11
```

```
l2tp-class L2TP_CLASS
```

```
authentication
```

```
password cisco
```

```
router bgp 2
```

```
address-family ipv4 vrf L2TP_VRF
```

```
redistribute connected
```

```
redistribute static
```

```
default-information originate
```

```
exit-address-family
```

Xconnect: **هنا نطبق راسمنا لاداء**

<#root>

```
ASR1004#sh ip rou vrf L2TP_VRF 1.1.1.1 . -----> Xconnect End Point also learned via VRF
```

Routing Table: L2TP_VRF

Routing entry for 1.1.1.1/32

Known via "bgp 2", distance 200, metric 0, type internal

Last update from 11.11.11.11 6d17h ago

Routing Descriptor Blocks:

* 11.11.11.11 (default), from 22.22.22.22, 6d17h ago

Route metric is 0, traffic share count is 1

AS Hops 0

MPLS label: 18

MPLS Flags: MPLS Required

We observed that Segment 2 was continuously flapping on both ends.

```
ASR1004#sh xc all de
```

Legend: XC ST=Xconnect State S1=Segment1 State S2=Segment2 State

UP=Up	DN=Down	AD=Admin Down	IA=Inactive
SB=Standby	HS=Hot Standby	RV=Recovering	NH=No Hardware

XC ST	Segment 1	S1	Segment 2	S2
-------	-----------	----	-----------	----

A horizontal dashed line with four tick marks. The tick marks are located at approximately one-quarter, three-quarters, and the far left and right ends of the line.

```
DN pri      ac Gi0/0/1:2380(Eth VLAN)      UP 12tp 1.1.1.1:2380
```

DN

[illegible]

Interworking: vlan

Session ID: 2543426569

Tunnel ID: 3352120314

Protocol State: DOWN

Remote Circuit State: DOWN

```
pw-class: PSEUDO_CLASS_VLAN
```

```
ASR1004#sh xc all de
```

Legend: XC ST=Xconnect State S1=Segment1 State S2=Segment2 State

UP=Up DN=Down AD=Admin Down IA=Inactive

SB=Standby HS=Hot Standby RV=Recovering NH=No Hardware

XC	ST	Segment 1	S1	Segment 2	S2
----	----	-----------	----	-----------	----

A horizontal dashed line with four tick marks. The tick marks are located at approximately one-quarter, three-quarters, and the far left and right ends of the line.

UP pri ac Gi0/0/1:2380(Eth VLAN) UP 12tp 1.1.1,1:2380

UP

[illegible]

Interworking: vlan

Session ID: 2543426569

Tunnel ID: 3352120314

Protocol State: UP

Remote Circuit State: UP

CPE: نم تال ج س ل ا

<#root>

```
CPE#sh xconnect all de
```

Legend: XC ST=Xconnect State S1=Segment1 State S2=Segment2 State

UP=Up DN=Down AD=Admin Down IA=Inactive

SB=Standby HS=Hot Standby RV=Recovering NH=No Hardware

XC	ST	Segment 1	S1	Segment 2	S2
----	----	-----------	----	-----------	----

-----+-----+-----+

```
DN pri      ac Fa4.2380:2380(Eth VLAN)      UP 12tp 2.2.2.2:2380      DN -----à Flapping w
```

Interworking: vlan

Session ID: 3434660693

Tunnel ID: 1760690853

Protocol State: DOWN

Remote Circuit State: DOWN

pw-class: PSEUDO_CLASS

UP pri ac Fa4.2381:2381(Eth VLAN) UP 12tp 3.3.3.3:2381 UP -----à St.

Interworking: vlan

Session ID: 1906980494

Tunnel ID: 2886222725

Protocol State: UP

Remote Circuit State: UP

pw-class: PSEUDO_CLASS

```
CPE#sh 12tp session
```

L2TP Session Information Total tunnels 2 sessions 2

LocID	RemID	TunID	Username, Intf/	State	Last Chg	Uniq ID
-------	-------	-------	-----------------	-------	----------	---------

Vcid, Circuit

2714490989 3697021268 1760690853 2380, Fa4.2380:2380 est

00:00:03 0

```
-----> Flapping with ASR1004
```

1906980494 2361475239 2886222725 2381, Fa4.2381:2381 est

15:37:06 0

-----> Stable with ASR1002

مت يتي ال MPLS هجاو يه جورخ ال هجاو نا شي حة لالحا هذه ي ف تباث راسم نيوكت كنكم ي ال
ىرخأل عم VRF ي ف امه نيوكت متو ىرخألل امه ادح ن اتدح م ن اتهجاو كانه ، لي دب لحك . اهنكم ت
رارقتس عم ، VRF هجاو ىل عماعل اراش ال ي ف تباث راسم نيوكت مت م ث . ماعل عضول ي ف
اذه Xconnect.

```
ASR1004#sh run int gi0/0/2
```

```
Building configuration...
```

```
Current configuration : 95 bytes
```

```
!
```

```
interface GigabitEthernet0/0/2 -----> Looped to Gi0/0/3
```

```
ip address 20.20.20.2 255.255.255.252
```

```
negotiation auto
```

```
end
```

```
#sh run int gi0/0/3
```

```
Building configuration...
```

```
Current configuration : 126 bytes
```

```
!
```

```
interface GigabitEthernet0/0/3
```

```
ip vrf forwarding L2TP_VRF
```

```
ip address 20.20.20.1 255.255.255.252
```

```
negotiation auto
```

```
end
```

```
ip route 10.246.131.62 255.255.255.255 20.20.20.1 -----> Static route pointing towards an IP interface
```

```
CPE#sh xconnect all de
```

UP=Up	DN=Down	AD=Admin Down	IA=Inactive
SB=Standby	HS=Hot Standby	RV=Recovering	NH=No Hardware

pw-class: PSEUDO_CLASS

pw-class: PSEUDO_CLASS

2: 2 قافنأل يلامجإ تامولعم ةسلج L2TP

15:37:06 0

ASR1004: ةلاح يف لالحا وه امك رورملا ةكرح قفدت ةظحال م متي

- MPLS gi0/0/1 ةهجاو يف يتأت اهنإف ، ASR1004 ىلع CPE نم رورملا ةكرح يتأت امدنع
Gi0/0/0. لوصو ذفنم ىلإ ةرشابم اهليوحت متي و
- ل يروحملا راسملا ذخأت اهنإف ، Access Port Gi0/0/0، ذفنم نم رورملا ةكرح يتأت امدنع
Gi0/0/0 -> Gi0/0/2 -> Gi0/0/3 -> Gi0/0/1.

ASR1000 يساسألا ماظنلا ىلع QFP مادختسا يه ليديبلا لالحا اذه عم ةيسيئرلا ةلكشملا
نيترم ةمزحلا ةجالعم متي شيح:

```
ASR1004# show platform packet-trace summary
```

Pkt	Input	Output	State	Reason
0	Gi0/0/3	Gi0/0/1	FWD	
1	Gi0/0/3	Gi0/0/1	FWD	
2	Gi0/0/3	Gi0/0/1	FWD	
3	Gi0/0/0	Gi0/0/2	FWD	
4	Gi0/0/0	Gi0/0/2	FWD	
5	Gi0/0/0	Gi0/0/2	FWD	
6	Gi0/0/0	Gi0/0/2	FWD	
7	Gi0/0/0	Gi0/0/2	FWD	

اذه Doc Bug: [CSCvi42964](#) يف قثوم كولسلا اذه

ةمچرتل هذه ل و ح

ةيلآل ا تاي ن ق ت ل ا ن م ة و م ج م ا د خ ت س ا ب د ن ت س م ل ا ا ذ ه Cisco ت م ج ر ت
م ل ا ع ل ا ا ح ن ا ع م ج ي ف ن ي م د خ ت س م ل ل م ع د ي و ت ح م م ي د ق ت ل ة ي ر ش ب ل و
ا م ك ة ق ي ق د ن و ك ت ن ل ة ي ل آ ة م ج ر ت ل ض ف ا ن ا ة ط ح ا ل م ي ج ر ي . ة ص ا خ ل ا م ه ت غ ل ب
Cisco ي ل خ ت . ف ر ت ح م م ج ر ت م ا ه م د ق ي ي ت ل ا ة ي ف ا ر ت ح ا ل ا ة م ج ر ت ل ا ع م ل ا ح ل ا و ه
ي ل ا م ا ة ا د ع و ج ر ل ا ب ي ص و ت و ت ا م ج ر ت ل ا ه ذ ه ة ق د ن ع ا ه ت ي ل و ئ س م Systems
(ر ف و ت م ط ب ا ر ل ا) ي ل ص ا ل ا ي ز ي ل ج ن ا ل ا د ن ت س م ل ا