# 在Windows電腦和思科路由器之間設定L2TP隧道

### 目錄

### 簡介

本檔案將說明如何在Windows機器和Cisco路由器之間設定第2層通道通訊協定(L2TP)通道。

# 必要條件

### 需求

思科建議您瞭解Windows計算機可對路由器上的物理介面IP地址執行ping。

#### 採用元件

本文件所述內容不限於特定軟體和硬體版本。

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除(預設))的組態來啟動。如果您的網路正在作用,請確保您已瞭解任何指令可能造成的影響。

### 設定

#### 網路圖表

本檔案會使用以下網路設定:



聚合器配置:

聚合器上的配置示例如下:

interface GigabitEthernet0/0/1 ip address 192.168.1.1 255.255.255.0 negotiation auto end interface Loopback100 ip address 172.16.1.1 255.255.255.255 end vpdn enable vpdn-group 1 ! Default L2TP VPDN group accept-dialin protocol 12tp virtual-template 1 no l2tp tunnel authentication interface Virtual-Template1 ip unnumbered Loopback100 peer default ip address pool test ppp authentication chap callout ppp ipcp dns 4.2.2.1 4.2.2.2 ip local pool test 10.1.1.2 10.1.1.100 end Windows電腦配置和設定

請完成以下步驟:

步驟1.開啟網路與共用中心,然後按一下Set up a new connection or network,如下圖所示。

🔾 💽 🗢 😟 « Network and Inte	ernet   Network and Sharing Center	<b>- - i i j</b>	Search Control Panel	Q
Control Panel Home	View your basic network informatio	n and set	up connections	C
Change adapter settings Change advanced sharing settings	ADMIN-PC Netwo (This computer) View your active networks	ork 5	Internet	See full map
	Work network	Ac Co	cess type: Internet nnections: 🎴 Local Area	Connection 5
	Change your networking settings Set up a new connection or network Set up a wireless, broadband, dia point.	VPN connection; or set up	a router or access	
	Connect to a network Connect or reconnect to a wireless, v	vired, dial-up	o, or VPN network connect	ion.
	Choose homegroup and sharing opt Access files and printers located on c	ions other networ	k computers, or change sh	aring settings.
See also HomeGroup Internet Options	Troubleshoot problems Diagnose and repair network probler	ns, or get tro	ubleshooting information	
Windows Firewall				

步驟2.選擇**連線到工作場所,**然後點選下一步

🌀 🙀 Set Up a Connection or Network	
Choose a connection option	
Connect to the Internet Set up a wireless, broadband, or dial-up connection to the Internet.	
Set up a new network Configure a new router or access point.	
Connect to a workplace Set up a dial-up or VPN connection to your workplace.	
Set up a dial-up connection Connect to the Internet using a dial-up connection.	
<u>N</u> ex	t Cancel

步驟3.選擇**使用我的Internet連線(VPN)** 



步驟4.輸入聚合器的IP地址(本例中為192.168.1.1),為連線指定一個名稱(本例中將該名稱命名 為VPDN),然後按一下**下一步**。

Connect to a Workplace	1									
Type the Internet add	ress to connect to									
Your network administrator										
Internet address:	Internet address: 192.168.1.1									
D <u>e</u> stination name:	VPDN	]								
Use a <u>s</u> mart card										
Allow other people to use this connection This option allows anyone with access to this computer to use this connection.										
Don't connect now;	just set it up so I can connect later									
	Ne	ext Cancel								

步驟5.輸入使用者名稱和密碼,然後按一下Connect

		- • •
🕒 🗽 Connect t	o a Workplace	
Type your	user name and password	
<u>U</u> ser name:	cisco	
Password:	•••••	
	Show characters	
Domain (optic	mal):	
_ 、		
		<u>C</u> onnect Cancel

步驟6.驗證使用者名稱和密碼



步驟7.可能首次失敗,如下圖所示。

Connect to a Workplace	
Connection failed with error 800	
<b>I</b>	
The remote connection was not made because the attempted VPN tunnels failed. The VPN server might be unreachable. If this connection is attempting to use an L2TP/IPsec tunnel, the security parameters required for IPsec negotiation might not be configured properly.	*
→ Iry again	
Set up the connection anyway	
Diagnose the problem	
	Cancel

步驟8.按一下「Set up the connection anyway」,然後開啟Networks索引標籤。



步驟9.按一下右鍵連線(此處VPDN),然後按一下**Properties**。驗證聚合器的IP地址(這裡為 192.168.1.1)

General Options Security Networking Sharing Host name or IP address of destination (such as microsoft.com or									
Host name or IP address of destination (such as microsoft.com or									
157.54.0.1 or 3ffe:1234::1111):									
192.168.1.1									
First connect									
Windows can first connect to a public network, such as the Internet, before trying to establish this virtual connection.									
Dial another connection first:									
See our online <u>privacy statement</u> for data collection and use information.									
OK Cancel									

步驟10.導覽至**Options>PPP Settings**,然後驗證設定,如下圖所示。

VPDN Properties									
General Options Security Networking Sharing									
Dialing options Display progress while connecting Prompt for name and password, certificate, etc. Include Windows logon domain									
PPP Settings									
Enable LCP extensions   Enable software compression   Negotiate multi-link for single-link connections   OK									
PPP Settings									
OK Cancel									

步驟11.導覽至Security >Type of VPN >Layer 2 Tunneling Protocol with IPsec,如下圖所示。

VPDN Properties									
General Options Security Networking Sharing									
Type of VPN:									
Automatic									
Automatic Point to Point Tunneling Protocol (PPTP) Laver 2 Tunneling Protocol with IPsec (L2TP/IPSec) Secure Socket Tunneling Protocol (SSTP) KEv2									
Authentication									
Use Extensible Authentication Protocol (EAP)									
P <u>r</u> operties									
Allow these protocols EAP-MSCHAPv2 will be used for IKEv2 VPN type. Select any of these protocols for other VPN types.									
Unencrypted password (PAP)									
Challenge Handshake Authentication Protocol (CHAP)									
Microsoft CHAP Version 2 (MS-CHAP v2)									
<u>A</u> utomatically use my Windows logon name and password (and domain, if any)									
OK Cancel									

步驟12.在Data encryption下拉選單中選擇No encryption allowed</mark>選項:

VPDN Properties
General Options Security Networking Sharing
Type of VPN:
Layer 2 Tunneling Protocol with IPsec (L2TP/IPSec)
Advanced settings
Require encryption (disconnect if server declines)
Optional encryption (connect even if no encryption) Require encryption (disconnect if server declines) Maximum strength encryption (disconnect if server declines) Properties
Allow these protocols
Unencrypted password (PAP)
Challenge Handshake Authentication Protocol (CHAP)
Microsoft CHAP Version 2 (MS-CHAP v2)
Automatically use my Windows logon name and password (and domain, if any)
OK Cancel

步驟13.取消選中Microsoft CHAP版本2,然後按一下OK。

VPDN Properties
General Options Security Networking Sharing
Type of VPN:
Layer 2 Tunneling Protocol with IPsec (L2TP/IPSec)
Advanced settings
Data encryption:
No encryption allowed (server will disconnect if it requires encry
Authentication
Use Extensible Authentication Protocol (EAP)
· · · · · · · · · · · · · · · · · · ·
Properties
Allow these protocols
Unencrypted password (PAP)
Challenge <u>H</u> andshake Authentication Protocol (CHAP)
Microsoft CHAP Version 2 (MS-CHAP v2)
Automatically use my Windows logon name and
password (and domain, if any)
OK Cancel

步驟14.開啟網路(這裡為VPDN),然後按一下「Connect」。



### 步驟15.輸入使用者名稱和密碼,然後按一下Connect

💱 Connect VPDN 🗾	3								
User name: cisco									
Password:									
Do <u>m</u> ain:									
Save this user name and password for the following users:	-								
─ Me o <u>nly</u>									
🛞 🔿 <u>A</u> nyone who uses this computer									
Connect Cancel Properties <u>H</u> elp	]								

# 驗證

步驟1.再次開啟**Networks**頁籤,選擇網路(在此示例中命名為VPDN)並驗證狀態為Connected。



步驟2.開啟命令提示符並運行ipconfig /all 命令。

PPI	' ada	pte	r VI	PDN:												
	Conn	iect	ion	-spe	eci	fi	C	Dŀ	IS	Su	ιff	i>	c	-	:	
	Desc	rip:	tior	n .	-	-	-	-	-	-	-	-	-	-		VPDN
	Phys	ica	1 A¢	ddre	ess		-	-	-	-	-	-	-	-	-	
	DHĊF	'En	able	ed.	-	-	-	-	-	-	-	-	-		=	No
	Auto	con	figu	urat	;io	n	En	al	ole	:d	-	-	_			Yes
	IPv4	l Ad	drĕ	ss.	_	_	-	-	-	-	_	-	_		:	10.1.1.9(Preferred)
	Subr	et	Masl	k.		_	_	_	_	_	_	_	_		-	255.255.255.255
	Defa	mlt	Gat	tewa	٩Ū	_	_	_	_	_	_	_	_	_	-	<u> </u>
	DNS	Ser	Uers	8 -		-									-	4.2.2.1
	2110								-							4 2 2 2
	NetE	BIOS	ove	er J	լշհ	oip	-	-	-	-	-	-	-	-	:	Enabled

完成PPP網際網路通訊協定控制通訊協定(IPCP)階段後,聚合器會指定IPv4位址和網域名稱伺服器 (DNS)。

步驟3.在聚合器上運行debug ppp negotiation命令和其他show命令:

Aggregator# \*Apr 12 06:17:38.148: PPP: Alloc Context [38726D0C] \*Apr 12 06:17:38.148: ppp11 PPP: Phase is ESTABLISHING \*Apr 12 06:17:38.148: ppp11 PPP: Using vpn set call direction \*Apr 12 06:17:38.148: ppp11 PPP: Treating connection as a callin

\*Apr 12 06:17:38.148: ppp11 PPP: Session handle[A600000B] Session id[11] \*Apr 12 06:17:38.148: ppp11 LCP: Event[OPEN] State[Initial to Starting] \*Apr 12 06:17:38.148: ppp11 PPP: No remote authentication for call-in \*Apr 12 06:17:38.148: ppp11 PPP LCP: Enter passive mode, state[Stopped] \*Apr 12 06:17:38.607: ppp11 LCP: I CONFREQ [Stopped] id 0 len 21 

 \*Apr 12 06:17:38.607: ppp11 LCP:
 MRU 1400 (0x01040578)

 \*Apr 12 06:17:38.607: ppp11 LCP:
 MagicNumber 0x795C7CD1 (0x0506795C7CD1)

 \*Apr 12 06:17:38.607: ppp11 LCP:
 PFC (0x0702)

 \*Apr 12 06:17:38.607: ppp11 LCP:
 ACFC (0x0802)

 \*Apr 12 06:17:38.607: ppp11 LCP:
 Callback 6 (0x0D0306)

 \*Apr 12 06:17:38.608: ppp11 LCP: O CONFREQ [Stopped] id 1 len 10 \*Apr 12 06:17:38.608: ppp11 LCP: MagicNumber 0xF7C3D2B9 (0x0506F7C3D2B9) \*Apr 12 06:17:38.608: ppp11 LCP: O CONFREJ [Stopped] id 0 len 7 \*Apr 12 06:17:38.608: ppp11 LCP: Callback 6 (0x0D0306) \*Apr 12 06:17:38.608: ppp11 LCP: Event[Receive ConfReq-] State[Stopped to REQsent] \*Apr 12 06:17:38.615: ppp11 LCP: I CONFACK [REQsent] id 1 len 10 \*Apr 12 06:17:38.615: ppp11 LCP: MagicNumber 0xF7C3D2B9 (0x0506F7C3D2B9) \*Apr 12 06:17:38.615: ppp11 LCP: Event[Receive ConfAck] State[REQsent to ACKrcvd] \*Apr 12 06:17:38.615: ppp11 LCP: I CONFREQ [ACKrcvd] id 1 len 18 \*Apr 12 06:17:38.615: ppp11 LCP: MRU 1400 (0x01040578) \*Apr 12 06:17:38.615: ppp11 LCP: MagicNumber 0x795C7CD1 (0x0506795C7CD1) \*Apr 12 06:17:38.616: ppp11 LCP: PFC (0x0702) \*Apr 12 06:17:38.616: ppp11 LCP: ACFC (0x0802) \*Apr 12 06:17:38.616: ppp11 LCP: O CONFNAK [ACKrcvd] id 1 len 8 \*Apr 12 06:17:38.616: ppp11 LCP: MRU 1500 (0x010405DC) \*Apr 12 06:17:38.616: ppp11 LCP: Event[Receive ConfReq-] State[ACKrcvd to ACKrcvd] \*Apr 12 06:17:38.617: ppp11 LCP: I CONFREQ [ACKrcvd] id 2 len 18 \*Apr 12 06:17:38.617: ppp11 LCP: MRU 1400 (0x01040578) \*Apr 12 06:17:38.617: ppp11 LCP: MagicNumber 0x795C7CD1 (0x0506795C7CD1) \*Apr 12 06:17:38.617: ppp11 LCP: PFC (0x0702) \*Apr 12 06:17:38.617: ppp11 LCP: ACFC (0x0802) \*Apr 12 06:17:38.617: ppp11 LCP: O CONFNAK [ACKrcvd] id 2 len 8 \*Apr 12 06:17:38.617: ppp11 LCP: MRU 1500 (0x010405DC) \*Apr 12 06:17:38.617: ppp11 LCP: Event[Receive ConfReq-] State[ACKrcvd to ACKrcvd] \*Apr 12 06:17:38.618: ppp11 LCP: I CONFREQ [ACKrcvd] id 3 len 18 \*Apr 12 06:17:38.618: ppp11 LCP: MRU 1500 (0x010405DC) \*Apr 12 06:17:38.618: ppp11 LCP: MagicNumber 0x795C7CD1 (0x0506795C7CD1) \*Apr 12 06:17:38.618: ppp11 LCP: PFC (0x0702) \*Apr 12 06:17:38.618: ppp11 LCP: ACFC (0x0802) \*Apr 12 06:17:38.618: ppp11 LCP: O CONFACK [ACKrcvd] id 3 len 18 \*Apr 12 06:17:38.618: ppp11 LCP: MRU 1500 (0x010405DC) \*Apr 12 06:17:38.618: ppp11 LCP: MagicNumber 0x795C7CD1 (0x0506795C7CD1) \*Apr 12 06:17:38.618: ppp11 LCP: PFC (0x0702) \*Apr 12 06:17:38.619: ppp11 LCP: ACFC (0x0802) \*Apr 12 06:17:38.619: ppp11 LCP: Event[Receive ConfReq+] State[ACKrcvd to Open] \*Apr 12 06:17:38.621: ppp11 LCP: I IDENTIFY [Open] id 4 len 18 magic 0x795C7CD1MSRASV5.20 \*Apr 12 06:17:38.621: ppp11 LCP: I IDENTIFY [Open] id 5 len 24 magic 0x795C7CD1MSRAS-0-ADMIN-PC \*Apr 12 06:17:38.621: ppp11 LCP: I IDENTIFY [Open] id 6 len 24 magic 0x795C7CD1Z8Of(U3G.cIwR<#! \*Apr 12 06:17:38.626: ppp11 PPP: Queue IPV6CP code[1] id[7] \*Apr 12 06:17:38.626: ppp11 PPP: Queue IPCP code[1] id[8] \*Apr 12 06:17:38.640: ppp11 PPP: Phase is FORWARDING, Attempting Forward \*Apr 12 06:17:38.640: ppp11 LCP: State is Open \*Apr 12 06:17:38.657: Vi3.1 PPP: Phase is ESTABLISHING, Finish LCP \*Apr 12 06:17:38.657: Vi3.1 PPP: Phase is UP \*Apr 12 06:17:38.657: Vi3.1 IPCP: Protocol configured, start CP. state[Initial] \*Apr 12 06:17:38.657: Vi3.1 IPCP: Event[OPEN] State[Initial to Starting] \*Apr 12 06:17:38.657: Vi3.1 IPCP: O CONFREQ [Starting] id 1 len 10 \*Apr 12 06:17:38.657: Vi3.1 IPCP: Address 172.16.1.1 (0x0306AC100101) \*Apr 12 06:17:38.657: Vi3.1 IPCP: Event[UP] State[Starting to REQsent] \*Apr 12 06:17:38.657: Vi3.1 PPP: Process pending ncp packets \*Apr 12 06:17:38.657: Vi3.1 IPCP: Redirect packet to Vi3.1 \*Apr 12 06:17:38.657: Vi3.1 IPCP: I CONFREQ [REQsent] id 8 len 34 \*Apr 12 06:17:38.657: Vi3.1 IPCP: Address 0.0.0.0 (0x03060000000) \*Apr 12 06:17:38.657: Vi3.1 IPCP: PrimaryDNS 0.0.0.0 (0x81060000000)

PrimaryWINS 0.0.0.0 (0x82060000000) \*Apr 12 06:17:38.657: Vi3.1 IPCP: \*Apr 12 06:17:38.657: Vi3.1 IPCP: SecondaryDNS 0.0.0.0 (0x83060000000) \*Apr 12 06:17:38.657: Vi3.1 IPCP: SecondaryWINS 0.0.0.0 (0x84060000000) \*Apr 12 06:17:38.657: Vi3.1 IPCP AUTHOR: Done. Her address 0.0.0.0, we want 0.0.0.0 \*Apr 12 06:17:38.657: Vi3.1 IPCP: Pool returned 10.1.1.9 \*Apr 12 06:17:38.657: Vi3.1 IPCP: O CONFREJ [REQsent] id 8 len 16 \*Apr 12 06:17:38.658: Vi3.1 IPCP: PrimaryWINS 0.0.0.0 (0x82060000000) \*Apr 12 06:17:38.658: Vi3.1 IPCP: SecondaryWINS 0.0.0.0 (0x84060000000) \*Apr 12 06:17:38.658: Vi3.1 IPCP: Event[Receive ConfReq-] State[REQsent to REQsent] \*Apr 12 06:17:38.658: Vi3.1 IPV6CP: Redirect packet to Vi3.1 \*Apr 12 06:17:38.658: Vi3.1 IPV6CP: I CONFREQ [UNKNOWN] id 7 len 14 \*Apr 12 06:17:38.658: Vi3.1 IPV6CP: Interface-Id F0AA:D7A4:5750:D93E (0x010AF0AAD7A45750D93E) \*Apr 12 06:17:38.658: Vi3.1 LCP: O PROTREJ [Open] id 2 len 20 protocol IPV6CP (0x0107000E010AF0AAD7A45750D93E) \*Apr 12 06:17:38.672: Vi3.1 IPCP: I CONFACK [REQsent] id 1 len 10 \*Apr 12 06:17:38.672: Vi3.1 IPCP: Address 172.16.1.1 (0x0306AC100101) \*Apr 12 06:17:38.672: Vi3.1 IPCP: Event[Receive ConfAck] State[REQsent to ACKrcvd] \*Apr 12 06:17:38.672: Vi3.1 IPCP: I CONFREQ [ACKrcvd] id 9 len 22 \*Apr 12 06:17:38.672: Vi3.1 IPCP: Address 0.0.0.0 (0x03060000000) \*Apr 12 06:17:38.672: Vi3.1 IPCP: PrimaryDNS 0.0.0.0 (0x81060000000) \*Apr 12 06:17:38.672: Vi3.1 IPCP: SecondaryDNS 0.0.0.0 (0x83060000000) \*Apr 12 06:17:38.672: Vi3.1 IPCP: O CONFNAK [ACKrcvd] id 9 len 22 \*Apr 12 06:17:38.672: Vi3.1 IPCP: Address 10.1.1.9 (0x03060A010109) PrimaryDNS 4.2.2.1 (0x810604020201) \*Apr 12 06:17:38.672: Vi3.1 IPCP: \*Apr 12 06:17:38.672: Vi3.1 IPCP: SecondaryDNS 4.2.2.2 (0x830604020202) \*Apr 12 06:17:38.672: Vi3.1 IPCP: Event[Receive ConfReq-] State[ACKrcvd to ACKrcvd] \*Apr 12 06:17:38.747: Vi3.1 IPCP: I CONFREQ [ACKrcvd] id 10 len 22 \*Apr 12 06:17:38.747: Vi3.1 IPCP: Address 10.1.1.9 (0x03060A010109) \*Apr 12 06:17:38.747: Vi3.1 IPCP: PrimaryDNS 4.2.2.1 (0x810604020201) \*Apr 12 06:17:38.747: Vi3.1 IPCP: SecondaryDNS 4.2.2.2 (0x830604020202) \*Apr 12 06:17:38.747: Vi3.1 IPCP: O CONFACK [ACKrcvd] id 10 len 22 \*Apr 12 06:17:38.748: Vi3.1 IPCP: Address 10.1.1.9 (0x03060A010109) \*Apr 12 06:17:38.748: Vi3.1 IPCP: PrimaryDNS 4.2.2.1 (0x810604020201) \*Apr 12 06:17:38.748: Vi3.1 IPCP: SecondaryDNS 4.2.2.2 (0x830604020202) \*Apr 12 06:17:38.748: Vi3.1 IPCP: Event[Receive ConfReq+] State[ACKrcvd to Open] \*Apr 12 06:17:38.768: Vi3.1 IPCP: State is Open \*Apr 12 06:17:38.769: Vi3.1 Added to neighbor route AVL tree: topoid 0, address 10.1.1.9 \*Apr 12 06:17:38.769: Vi3.1 IPCP: Install route to 10.1.1.9

Aggregator#show	caller i	<u>,</u>			
Line	User	IP Address	s Local Number	Remote Number	<->
Vi3.1	-	10.1.1.9	-	-	in
Aggregator#show ip interface brief   exclude un					
Interface IP		P-Address	OK? Method Status	I	Protocol
GigabitEthernet0/0/1 192		92.168.1.1	YES manual up	up	
Loopback100	1'	72.16.1.1	YES manual up	υ	ıp

步驟4.驗證Windows電腦是否可以到達聚合器(本例中為Loopback 100介面)之後的遠端網路

#### C:\Users\admin>ping 172.16.1.1

Pinging 172.16.1.1 with 32 bytes of data: Reply from 172.16.1.1: bytes=32 time=1ms TTL=255 Reply from 172.16.1.1: bytes=32 time<1ms TTL=255 Reply from 172.16.1.1: bytes=32 time<1ms TTL=255 Reply from 172.16.1.1: bytes=32 time<1ms TTL=255 Ping statistics for 172.16.1.1: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 0ms, Maximum = 1ms, Average = 0ms

### 疑難排解

目前尚無適用於此組態的具體疑難排解資訊。

# 相關資訊

- <u>瞭解VPDN</u>
- <u>T技術支援與檔案 Cisco Systems</u>