Windows 시스템과 Cisco 라우터 간에 L2TP 터널 설정

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소개

이 문서에서는 Windows 시스템과 Cisco 라우터 간에 L2TP(Layer 2 Tunneling Protocol) 터널을 구성하는 방법에 대해 설명합니다.

사전 요구 사항

요구 사항

Windows 시스템이 라우터에서 물리적 인터페이스 IP 주소를 ping할 수 있다는 사실을 알고 있는 것 이 좋습니다.

사용되는 구성 요소

이 문서는 특정 소프트웨어 및 하드웨어 버전으로 한정되지 않습니다.

이 문서의 정보는 특정 랩 환경의 디바이스를 토대로 작성되었습니다.이 문서에 사용된 모든 디바 이스는 초기화된(기본) 컨피그레이션으로 시작되었습니다.현재 네트워크가 작동 중인 경우, 모든 명령어의 잠재적인 영향을 미리 숙지하시기 바랍니다.

구성

네트워크 다이어그램

이 문서에서는 다음 네트워크 설정을 사용합니다.



구성

집계 구성:

Aggregator의 컨피그레이션 예는 다음과 같습니다.

interface GigabitEthernet0/0/1 ip address 192.168.1.1 255.255.255.0 negotiation auto interface Loopback100 end 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 end ip local pool test 10.1.1.2 10.1.1.100 Windows 컴퓨터 구성 및 설정

다음 단계를 완료하십시오.

1단계. **네트워크 및 공유 센터**를 열고 이 이미지**에** 표시된 대로 **새 연결 또는 네트워크 설정**을 클릭 합니다.

💽 🗢 🙀 « Network and Intern	et 🔸 Network and Sharing Center	▼ 4 j	Search Control Panel	Q
Control Panel Home	View your basic network infor	mation and set	up connections	0
Change adapter settings Change advanced sharing settings	ADMIN-PC (This computer) View your active networks Network 5 Work network Change your networking settings Set up a new connection or m Set up a wireless, broadband, point. Connect to a network Connect to a network Connect to a network Connect or reconnect to a wi Choose homegroup and shar Access files and printers locat Troubleshoot problems Diagnose and repair network	Network 5 Network 5 Acc Con Network dia p, ad hoc, or N reless, wired, dial-up ring options ted on other network problems, or get tro	Internet Con cess type: Internet nnections: I Local Area (/PN connection; or set up a b, or VPN network connection computers, or change sha ubleshooting information.	See full map

2단계. Connect to **a Workplace(작업 공간에 연결)를 선택하고 Next(다음**)를 클릭합니다.

6	- • •
💮 🐏 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

3단계. Use my Internet Connection (VPN)(내 인터넷 연결 사용(VPN))을 선택합니다.



4단계. Aggregator의 IP 주소(이 경우 192.168.1.1)을 입력하고 연결에 이름을 지정하고(이 경우 VPDN으로 이름을 지정) **Next(다음**)를 클릭합니다.

-										
🚱 🔚 Connect to a Workplace										
Type the Internet add	ress to connect to									
Your network administrator										
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									
		ext Cancel								

5단계. 사용자 이름과 비밀번호를 입력하고 Connect(연결)를 클릭합니다.

_			
\bigcirc	Connect to a Workplace		
	Type your user name a	and password	
	<u>U</u> ser name:	cisco	
	Password:	•••••	
		Show characters	
	<u>D</u> omain (optional):		
			Connect Cancel

6단계. 사용자 이름과 비밀번호를 확인합니다.



7단계. 이 이미지에 표시된 대로 처음으로 실패할 수 있습니다.

Connect to a Workplace	- • •
Connection failed with error 800	
N	
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
	Cancer

8단계. Set up the connection anyway(연결 설정)를 클릭하고 Networks 탭을 엽니다.



9단계. 연결(VPDN 위치)을 마우스 오른쪽 버튼으로 클릭하고 **속성**을 클릭합니다.어그리게이터의 IP 주소 확인(192.168.1.1 참조)

VPDN Properties										
General Options Security Networking Sharing										
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										

10단계. **옵션>PPP 설정**으로 이동하여 이 이미지에 표시된 대로 설정을 확인합니다.

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										

11단계. 이 이미지에 표시된 대로 **Security(보안) > Type of VPN(VPN 유형) > Layer 2 Tunneling Protocol with IPsec(IPsec**을 사용하는 레이어 2 터널링 프로토콜)으로 이동합니다.

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)								
Authentication								
© Use Extensible Authentication Protocol (EAP)								
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)								
Automatically use my Windows logon name and password (and domain, if any)								
OK Cancel								

12단계. Data encryption(데이터 암호화) 드롭다운 메뉴 아래에서 **No encryption allowed(암호화 허 용 안 함**) 옵션을 선택합니다.

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)
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

13단계. Microsoft CHAP 버전 2의 선택을 취소하고 확인을 클릭합니다.

VPDN Properties
General Options Security Networking Sharing
Type of VPN:
Layer 2 Tunneling Protocol with IPsec (L2TP/IPSec)
Advanced settings
No encryption allowed (server will disconnect if it requires encry
Authentication
Use Extensible Authentication Protocol (EAP)
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

14단계. 네트워크(여기 VPDN)를 열고 **연결**을 클릭합니다**.**



15단계. 사용자 이름과 비밀번호를 입력하고 연결을 클릭합니다.

💱 Connect VPDN 💽
User name: Cisco
Password:
Do <u>m</u> ain:
Save this user name and password for the following users:
─ Me o <u>n</u> ly
Anyone who uses this computer
Connect Cancel Properties <u>H</u> elp

다음을 확인합니다.

1단계. **Networks** 탭을 다시 열고 네트워크(이 예에서는 VPDN이라는 이름)를 선택하고 상태가 Connected인지 확인합니다.



2단계. 명령 프롬프트를 열고 ipconfig /all 명령을 실행합니다.

PPP	ada	apte	er	VP)	DN:												
	Conr	nect	tio	n-:	spe	ci	i f i	ic	D	NS	Sı	ιff	fi>	ĸ	-	:	
	Desc	rij	pti	lon	-	-	-	-	-	-	-	-	-	-	-		VPDN
	Phys	sica	al	Ad	dre	ss		-	-	-	-	-	-	-	-	-	
	DHĒE	P Er	nab	le	d.	-	-	-		-	-	-	-	-	-	-	No
	Auto	ocor	nfi	gw	rat	:io	n	Er	ıal	b 10	ed	_	_	_	_		Yes
	I Pv4	1 Ac	ldr	es	s.	-	-	-	-	-	-	-	-	-	-	=	10.1.1.9(Preferred)
	Subr	net	Ma	ısk	_	_	-	-	-	-	_	_		_	-	-	255.255.255.255
	Defa	ault	t G	at	ewa	Ų	_	_		_	_			_	_	-	0.0.0.0
	DNS	Sei	rve	rs	_	<u> </u>	_	_	_	_	_	_	_	_	_	-	4.2.2.1
					-	-	-	-	-	-	-	_	-	_	-		4.2.2.2
	NetI	BIOS	S o	ve	r T	cp	oir).	-	-	-	-	-	-	-	:	Enabled

IPv4 주소 및 DNS(Domain Name Server)는 PPP IPCP(Internet Protocol Control Protocol) 단계를 완료한 후 Aggregator에서 할당됩니다.

3단계. debug ppp negotiation 명령과 aggregator에서 다른 show 명령을 실행합니다.

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)

*Apr 12 06:17:38.657: Vi3.1 IPCP: PrimaryWINS 0.0.0.0 (0x82060000000) *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) *Apr 12 06:17:38.672: Vi3.1 IPCP: PrimaryDNS 4.2.2.1 (0x810604020201) *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 ip				
Line	User	IP Address	Local Number	Remote Number	<->
Vi3.1	-	10.1.1.9		-	in
Aggregator#show ip interface brief exclude un					
Interface	IP-2	Address OK?	Method Status	Pr	rotocol
GigabitEthernet(0/0/1 192	.168.1.1 YES m	anual up	up	
Loopback100	172	.16.1.1 YES	manual up	սբ	2
4단계. Windows 컴퓨터가 Aggregator 뒤의 원격 네트워크에 연결할 수 있는지 확인합니다(이 경우					

Loopback 100 인터페이스).

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

문제 해결

현재 이 컨피그레이션에 사용할 수 있는 특정 문제 해결 정보가 없습니다.

관련 정보

- <u>VPDN 이해</u>
- <u>T기술 지원 및 문서 Cisco Systems</u>