

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 것이 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 디바이스는 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:

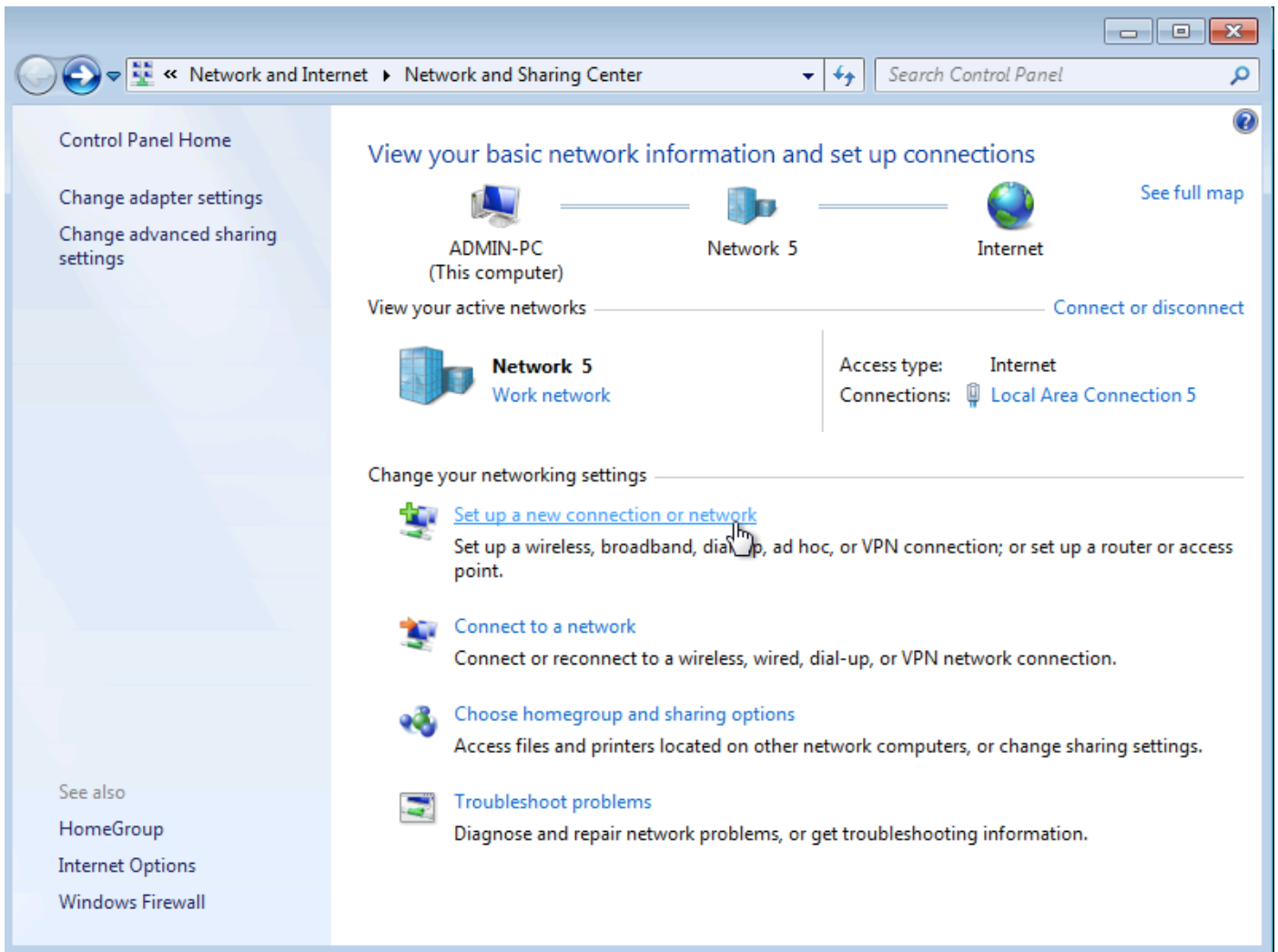
Aggregator의 컨피그레이션 예는 다음과 같습니다.

```
interface GigabitEthernet0/0/1
 ip address 192.168.1.1 255.255.255.0
 negotiation auto
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 l2tp
 virtual-template 1
no l2tp tunnel authentication interface Virtual-Templat1
 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
```

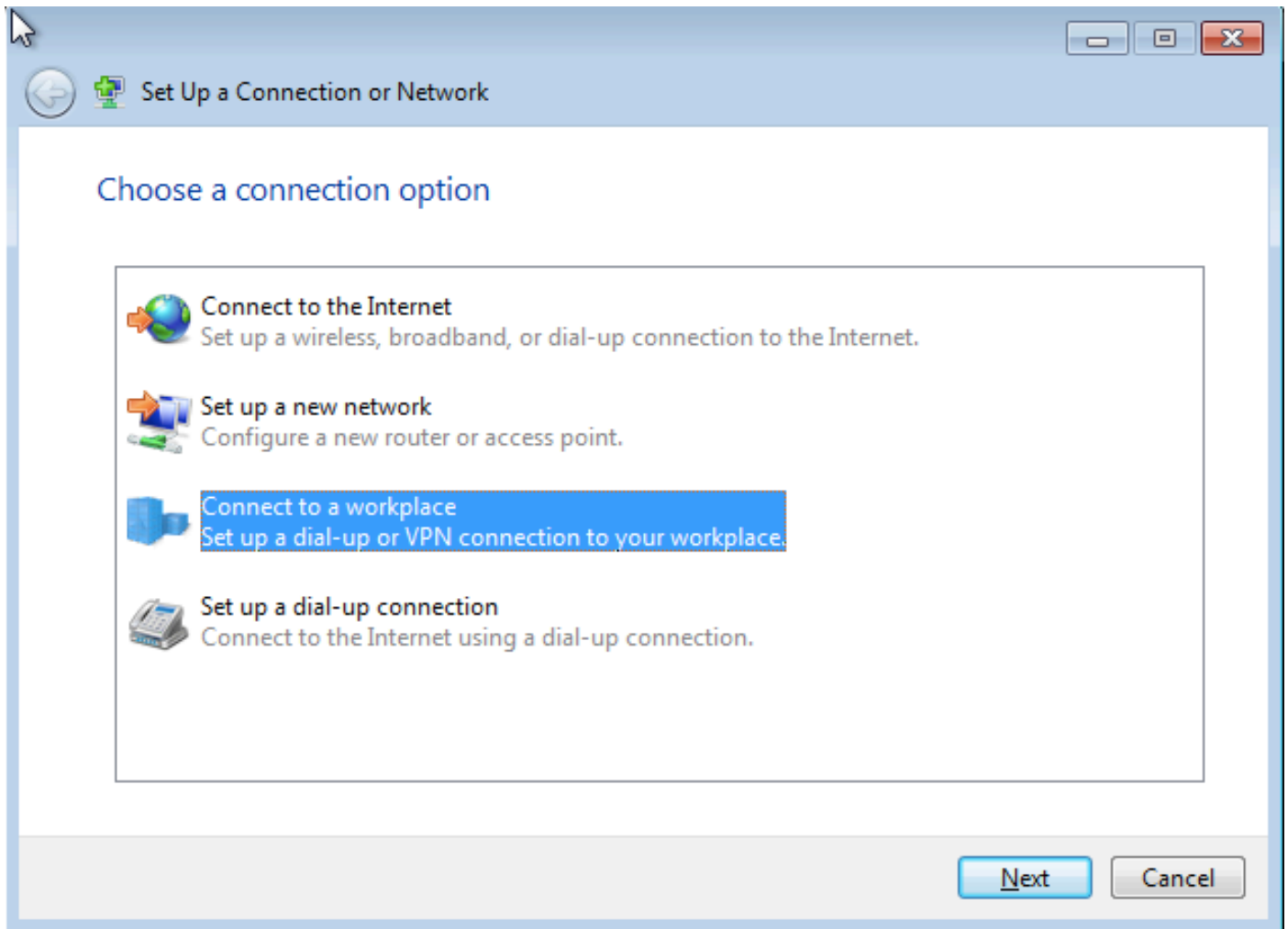
Windows 컴퓨터 구성 및 설정

다음 단계를 완료하십시오.

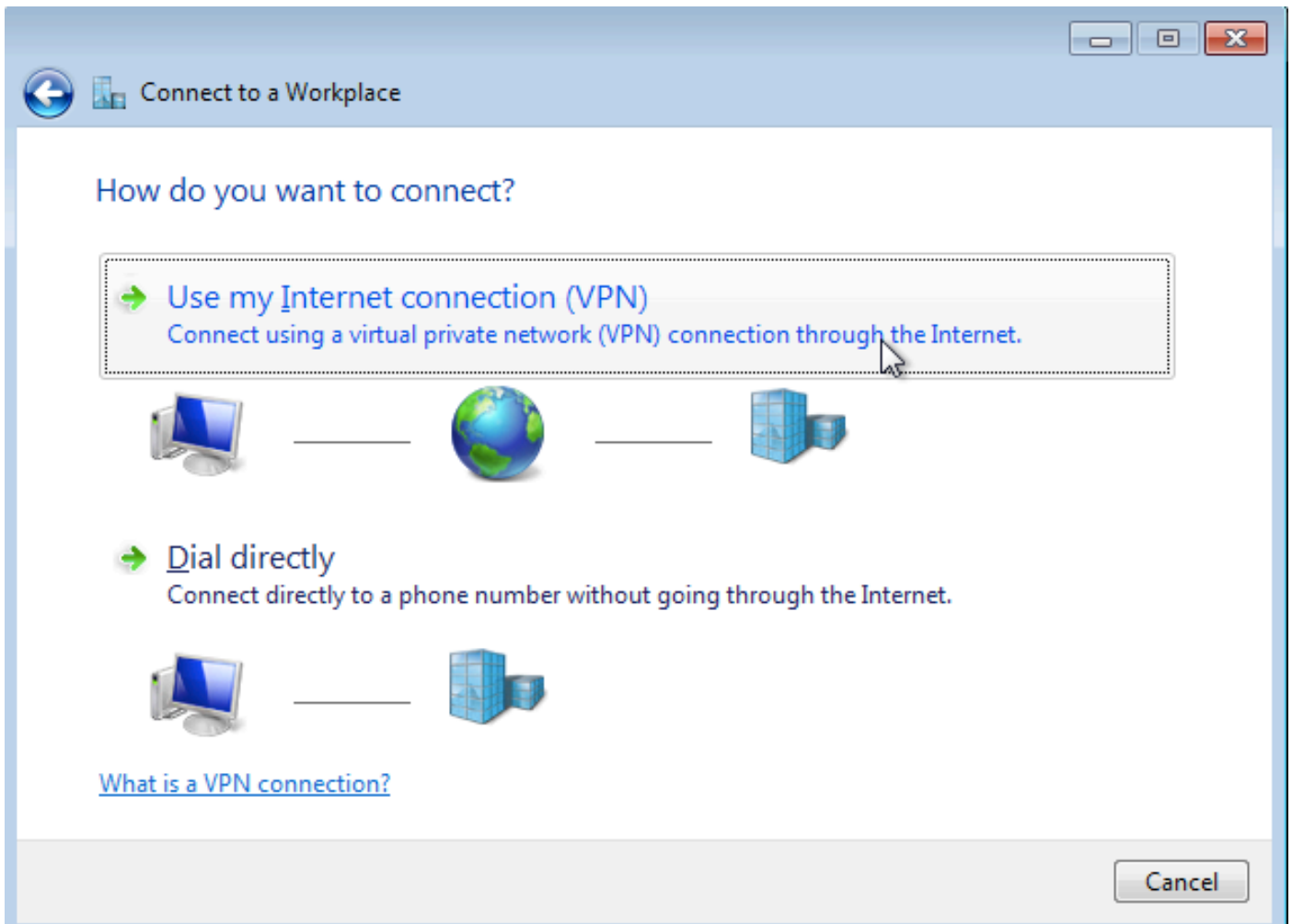
1단계. **네트워크 및 공유 센터**를 열고 이 이미지에 표시된 대로 **새 연결** 또는 **네트워크 설정**을 클릭합니다.



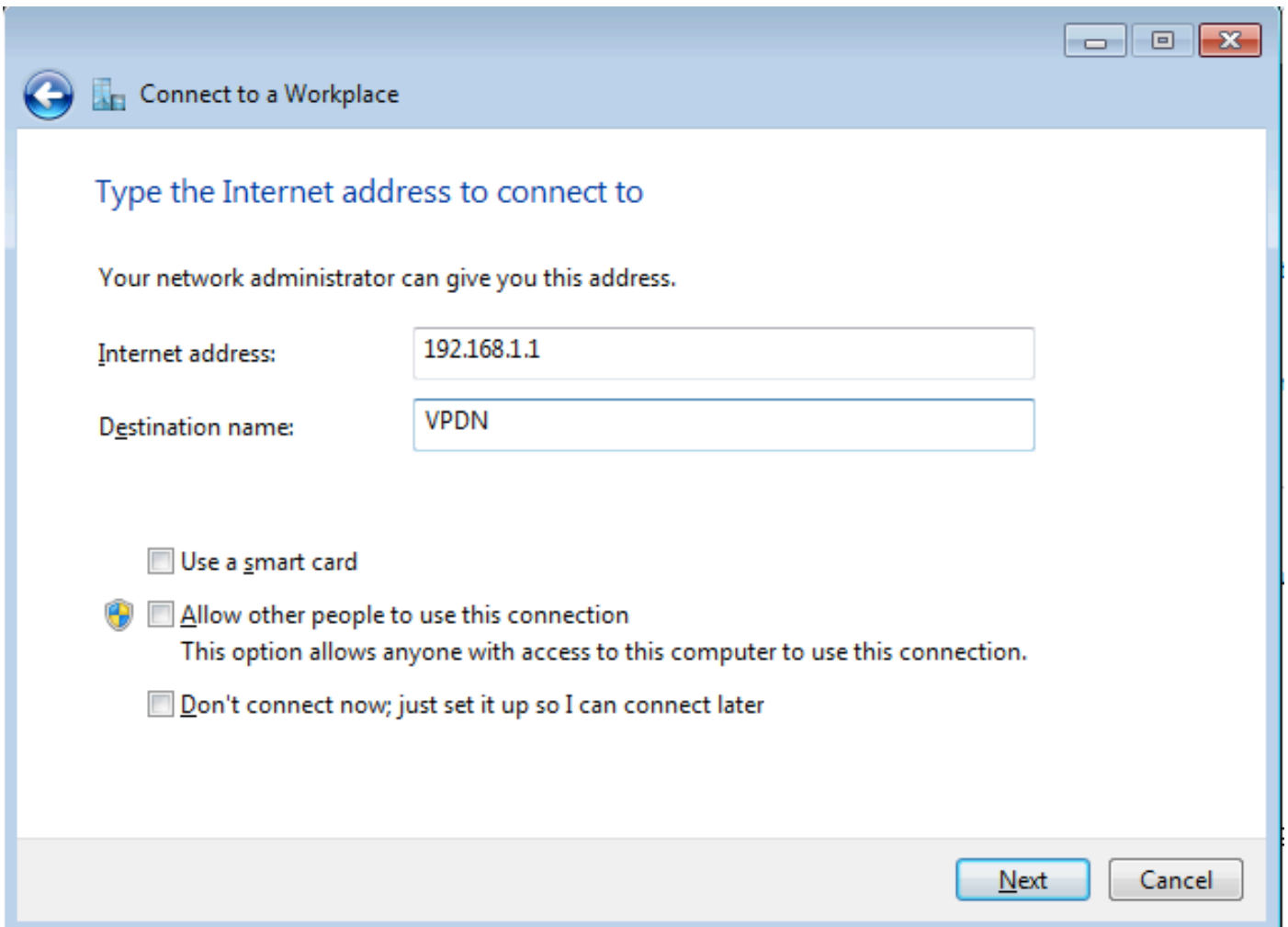
2단계. Connect to a Workplace(작업 공간에 연결)를 선택하고 Next(다음)를 클릭합니다.



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.



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

Connect to a Workplace

Type your user name and password

User name: cisco

Password: ●●●●●

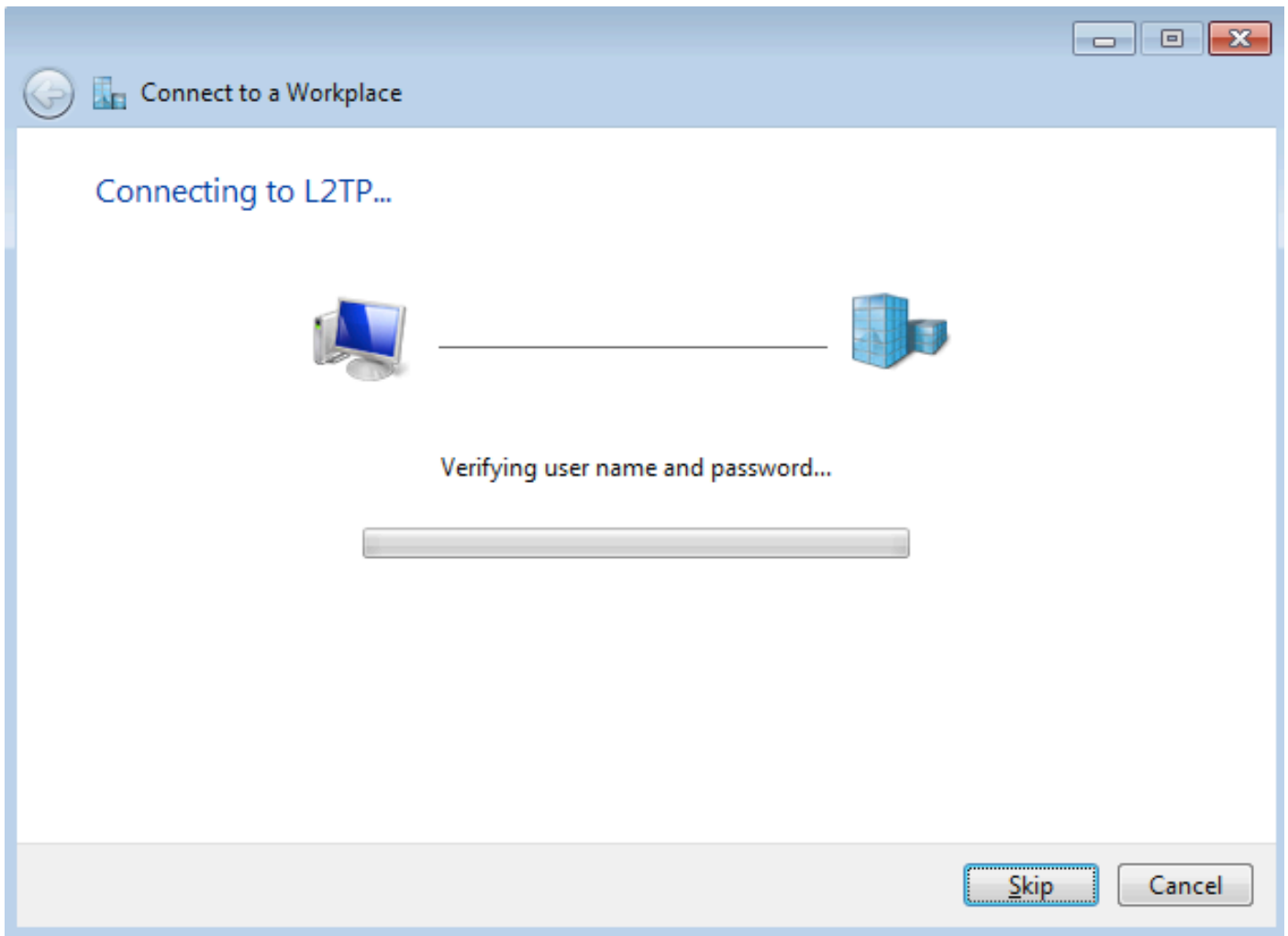
Show characters

Remember this password

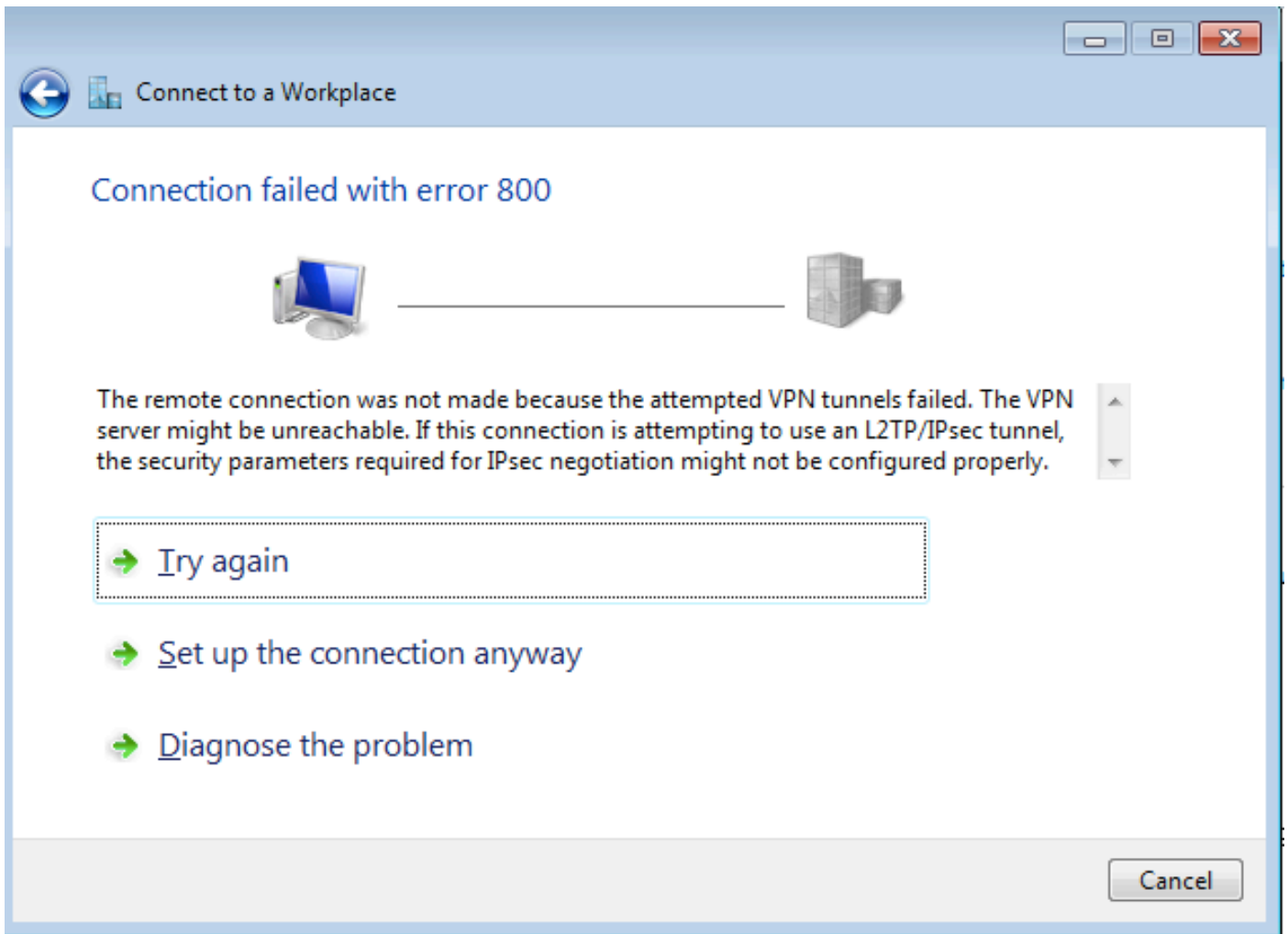
Domain (optional):

Connect Cancel

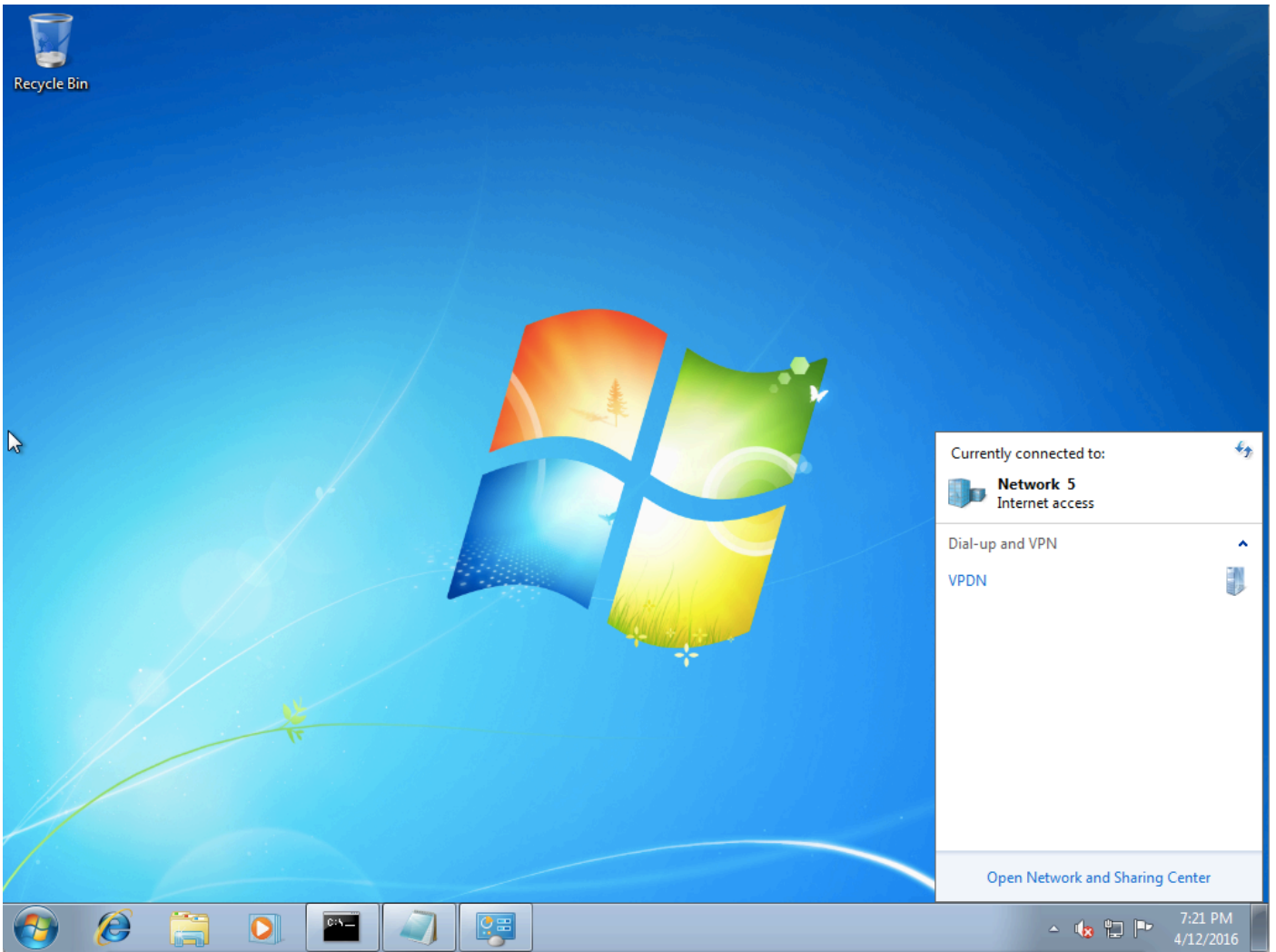
6단계. 사용자 이름과 비밀번호를 확인합니다.



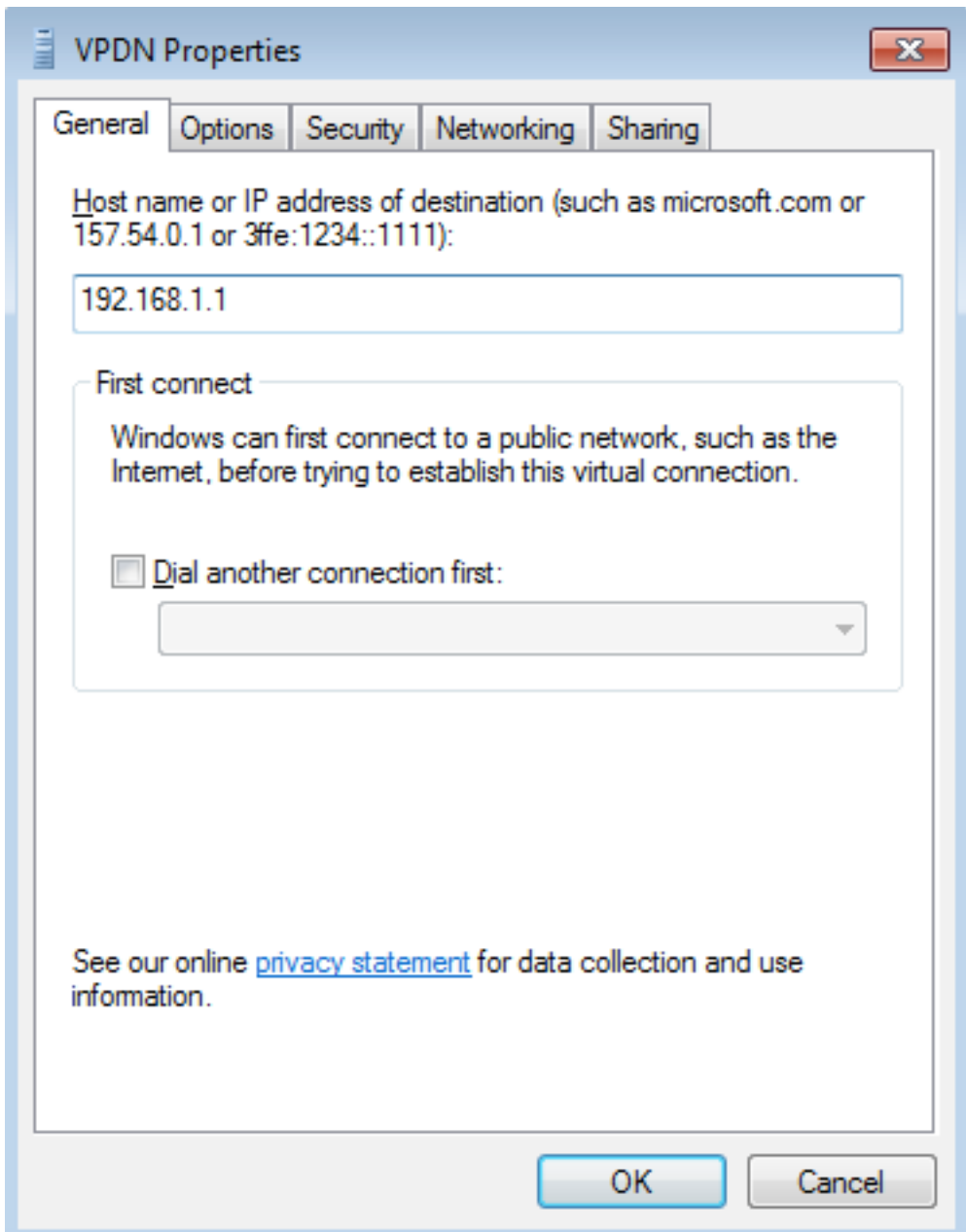
7단계. 이 이미지에 표시된 대로 처음으로 실패할 수 있습니다.



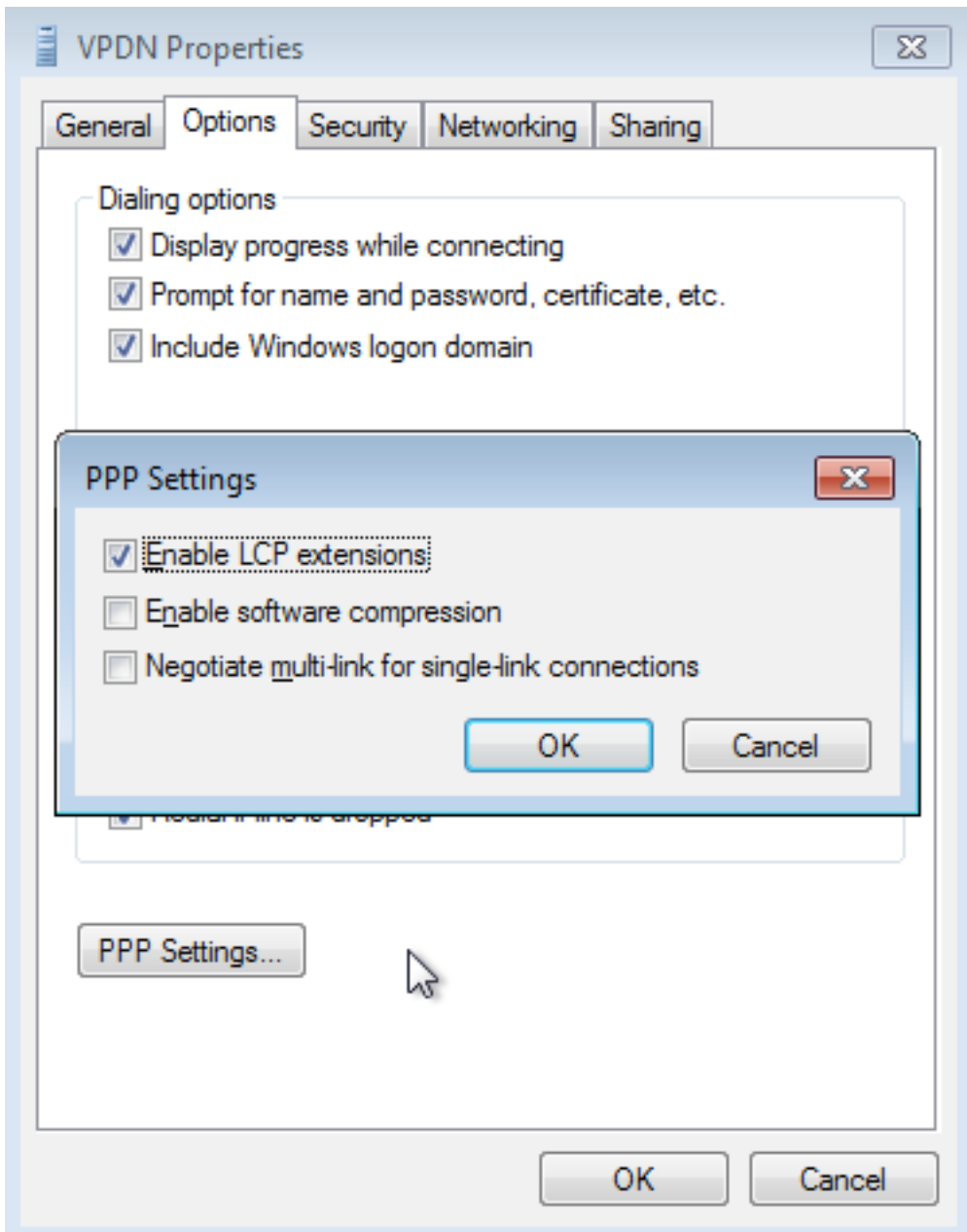
8단계. **Set up the connection anyway**(연결 설정)를 클릭하고 **Networks** 탭을 엽니다.



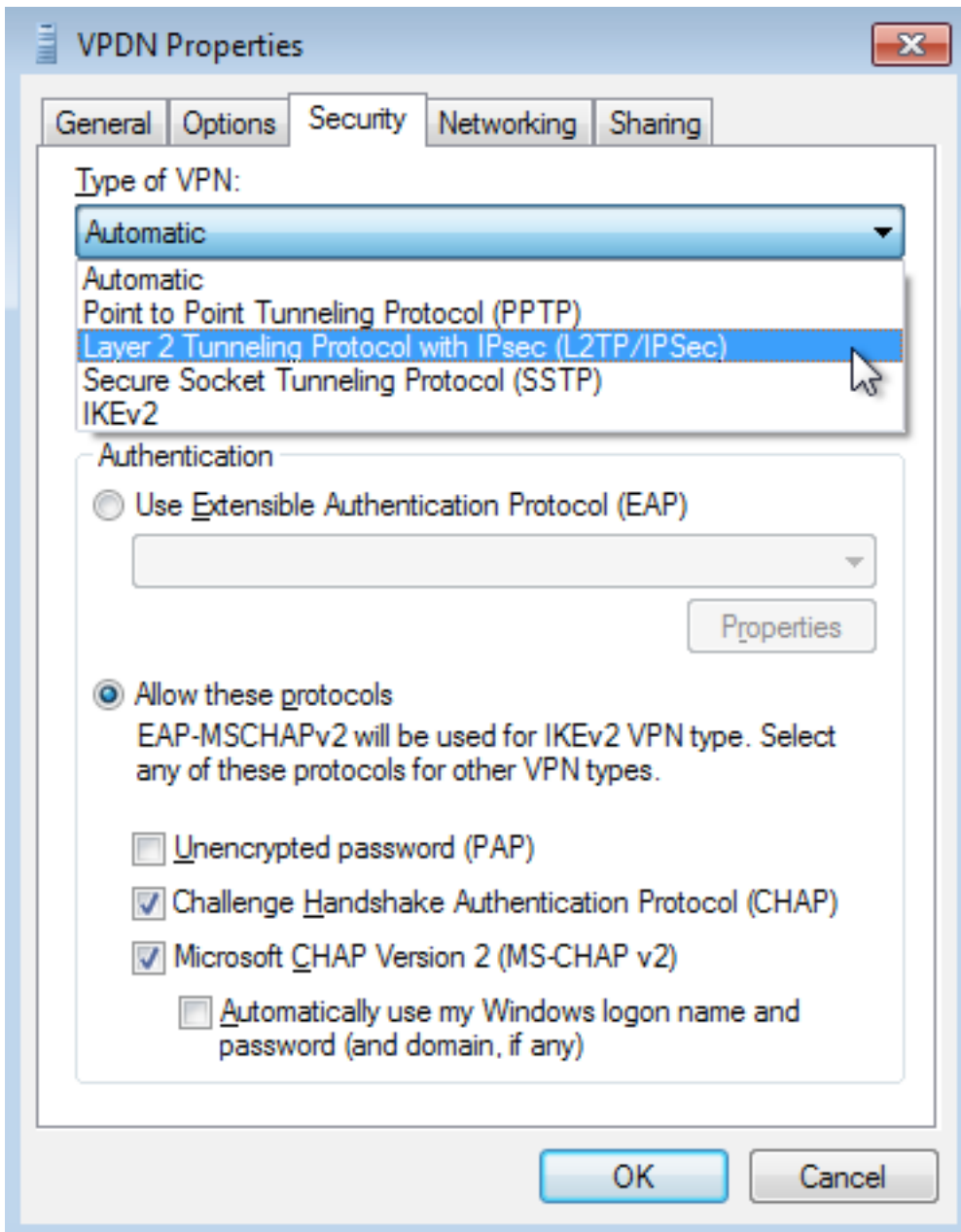
9단계. 연결(VPDN 위치)을 마우스 오른쪽 버튼으로 클릭하고 속성을 클릭합니다. 어그리게이터의 IP 주소 확인(192.168.1.1 참조)



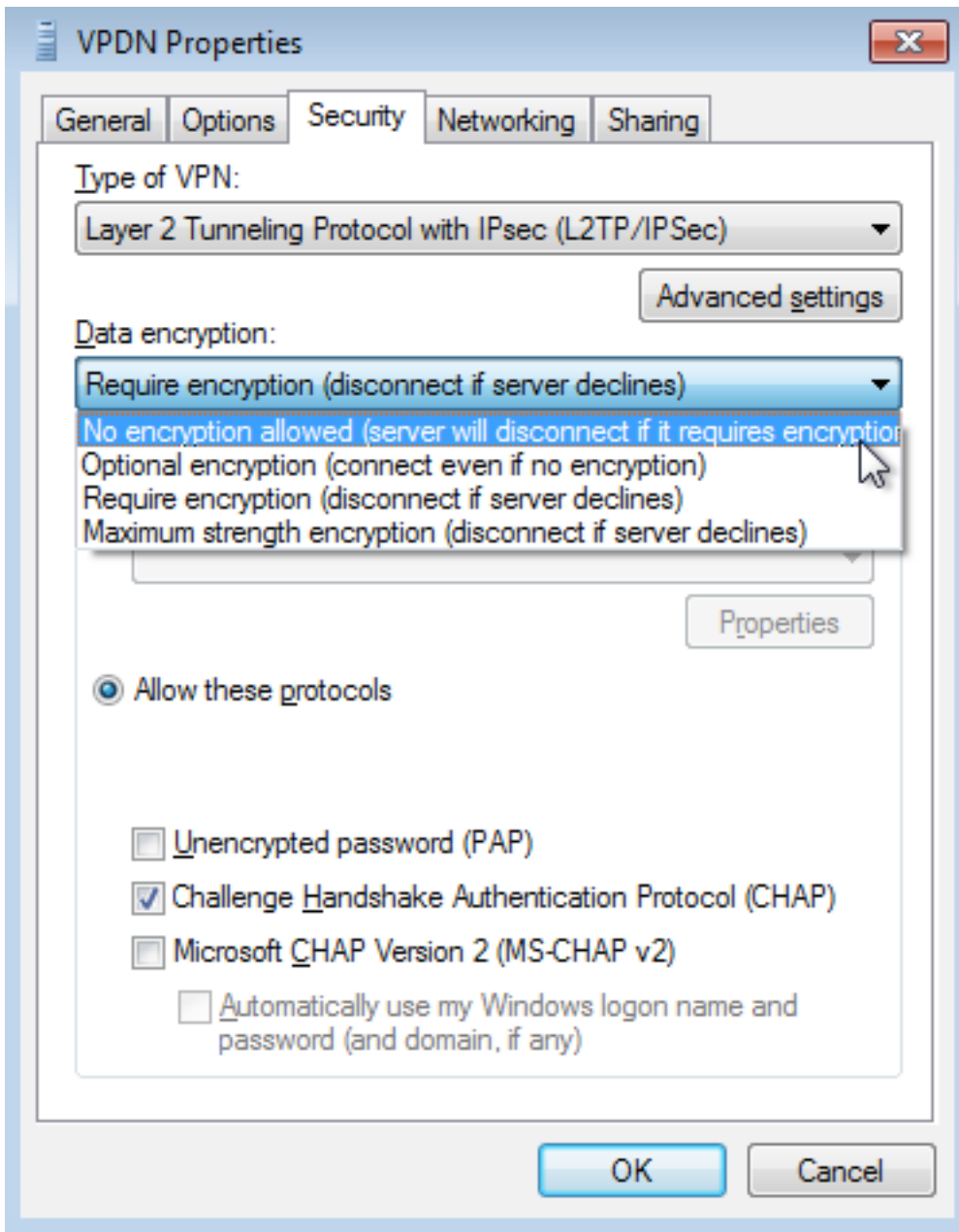
10단계. 옵션>PPP 설정으로 이동하여 이 이미지에 표시된 대로 설정을 확인합니다.



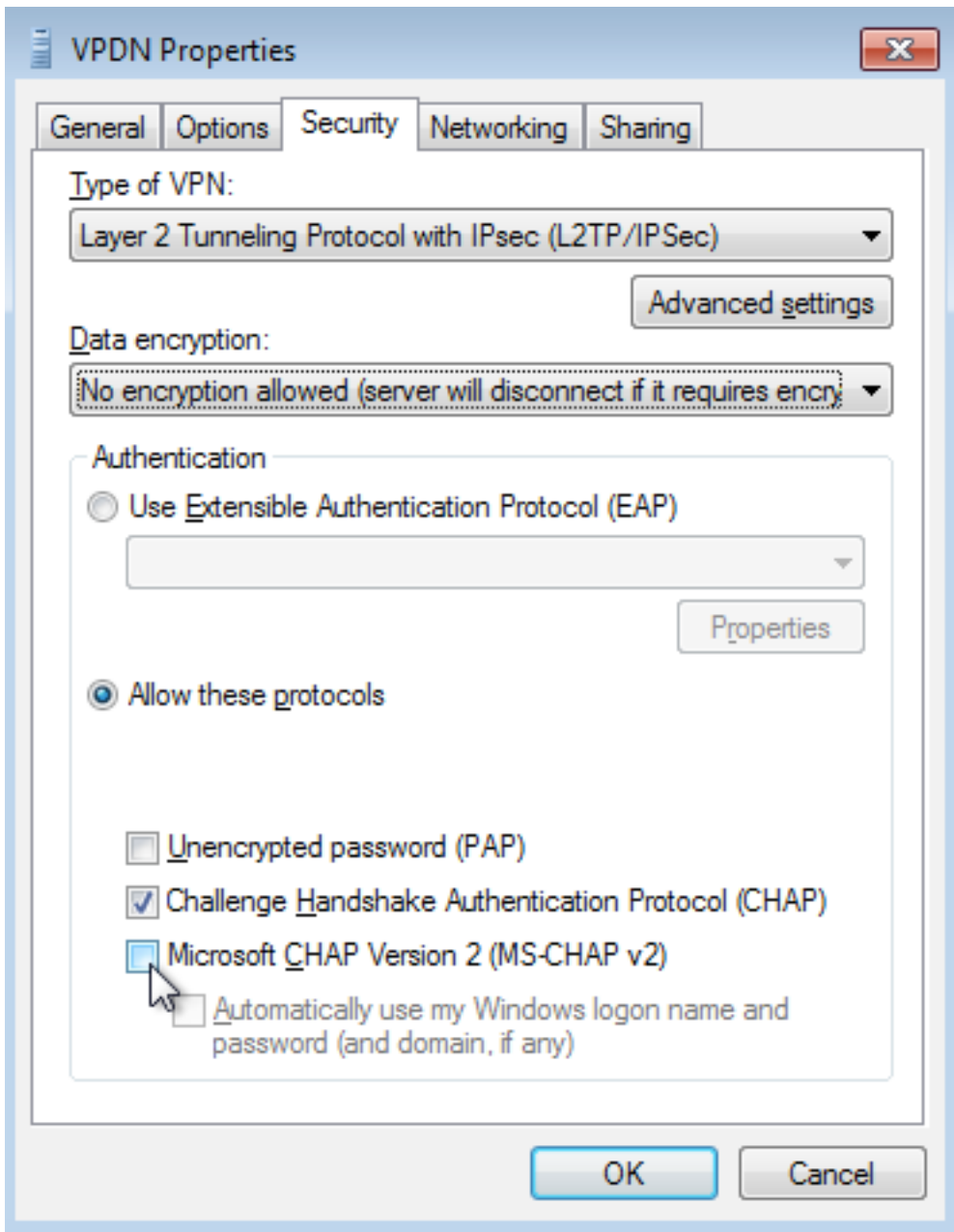
11단계. 이 이미지에 표시된 대로 **Security(보안) > Type of VPN(VPN 유형) > Layer 2 Tunneling Protocol with IPsec(IPsec을 사용하는 레이어 2 터널링 프로토콜)**으로 이동합니다.



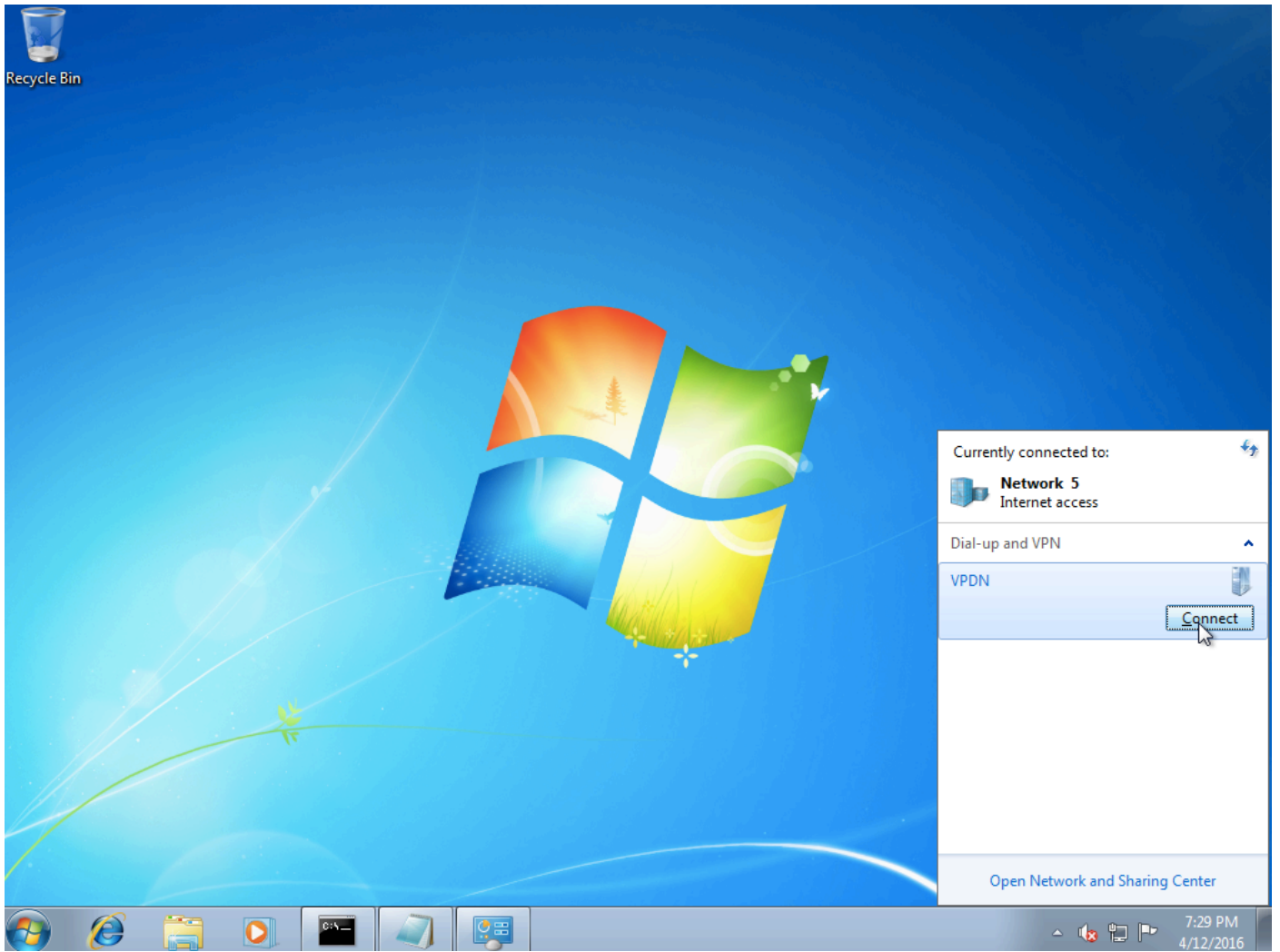
12단계. Data encryption(데이터 암호화) 드롭다운 메뉴 아래에서 No encryption allowed(암호화 허용 안 함) 옵션을 선택합니다.



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



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

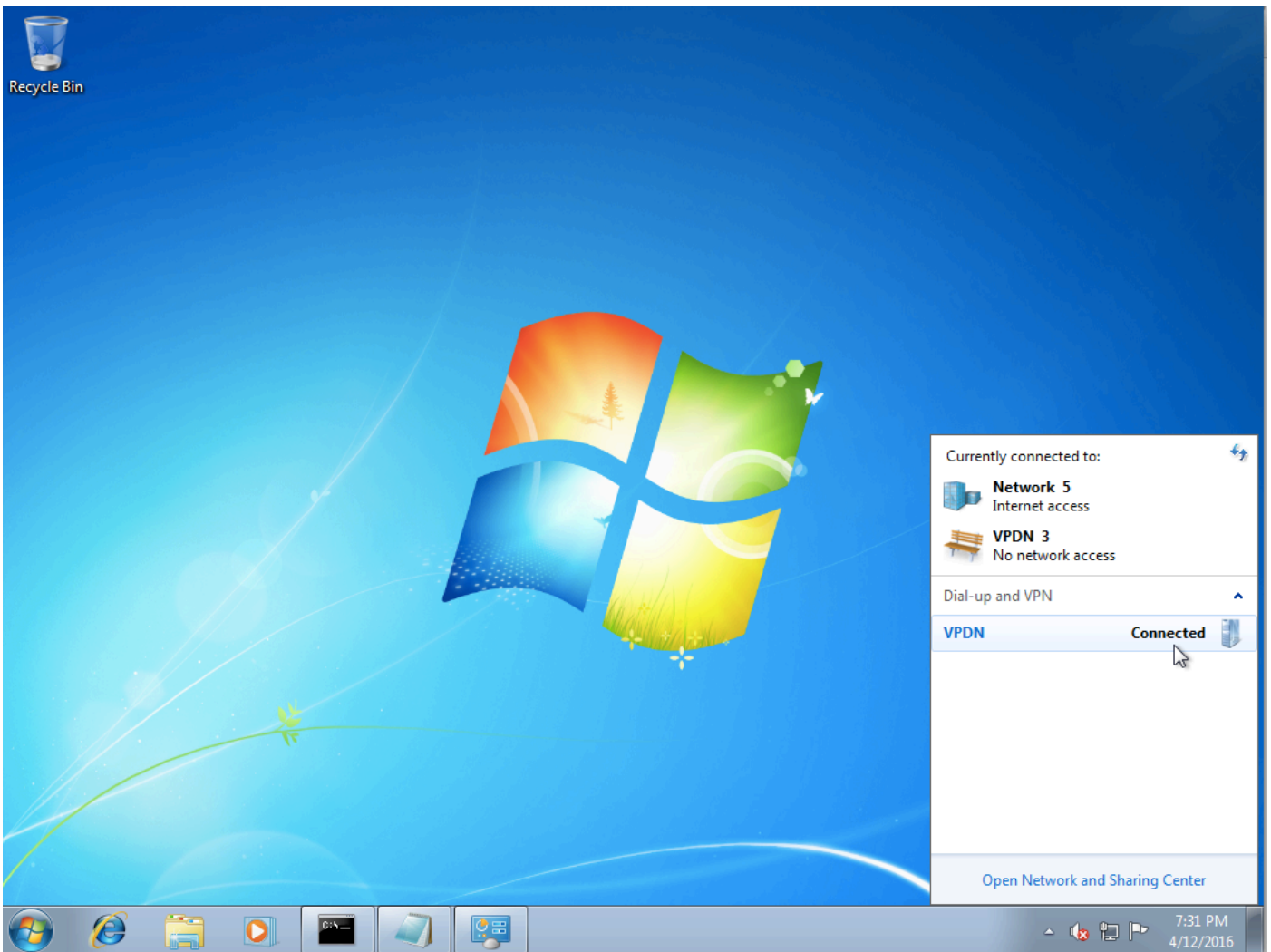


15단계. 사용자 이름과 비밀번호를 입력하고 **연결**을 클릭합니다.



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 adapter UPDN:

Connection-specific DNS Suffix . . . . . : UPDN
Description . . . . . : 
Physical Address . . . . . : 
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . . : Yes
IPv4 Address. . . . . : 10.1.1.9<Preferred>
Subnet Mask . . . . . : 255.255.255.255
Default Gateway . . . . . : 0.0.0.0
DNS Servers . . . . . : 4.2.2.1
                          4.2.2.2
NetBIOS over Tcpip. . . . . : 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 CONFREQ [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 (0x030600000000)
*Apr 12 06:17:38.657: Vi3.1 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
```

```

*Apr 12 06:17:38.657: Vi3.1 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
*Apr 12 06:17:38.657: Vi3.1 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
*Apr 12 06:17:38.657: Vi3.1 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
*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 CONFREQ [REQsent] id 8 len 16
*Apr 12 06:17:38.658: Vi3.1 IPCP: PrimaryWINS 0.0.0.0 (0x820600000000)
*Apr 12 06:17:38.658: Vi3.1 IPCP: SecondaryWINS 0.0.0.0 (0x840600000000)
*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 PROTREQ [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 (0x030600000000)
*Apr 12 06:17:38.672: Vi3.1 IPCP: PrimaryDNS 0.0.0.0 (0x810600000000)
*Apr 12 06:17:38.672: Vi3.1 IPCP: SecondaryDNS 0.0.0.0 (0x830600000000)
*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-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0/1	192.168.1.1	YES	manual	up	up
Loopback100	172.16.1.1	YES	manual	up	up

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

- [VPDN 이해](#)
- [T기술 지원 및 문서 - Cisco Systems](#)