ASR1k Series 라우터에서 BDI를 통한 PPPoE 구성

목차

[소개](#)
[사전 요구 사항](#)
[요구 사항](#)
[사용되는 구성 요소](#)
[구성](#)
[네트워크 다이어그램](#)
[다음을 확인합니다.](#)
[문제 해결](#)
[관련 정보](#)

소개

이 문서에서는 BDI(Bridge Domain Interface) 및 vlan 범위를 사용하여 PPPoE(Point-to-Point Protocol over Ethernet) 서버를 구성하는 방법에 대해 설명합니다.

사전 요구 사항

요구 사항

다음 주제에 대한 지식을 보유하고 있으면 유용합니다.

- 엔드 투 엔드 레이어 1 연결성이 양호함
- PPP와 PPPoE의 기본 사항을 잘 이해하고 있음

사용되는 구성 요소

이 문서의 정보는 다음 소프트웨어 및 하드웨어 버전을 기반으로 합니다.

- HOST-1 - CISCO887G
- HOST-2 - CISCO887
- 스위치 - WS-C3560-24TS-S
- PPPoE 서버 - ASR1001-X

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

참고:이 섹션에 사용된 명령에 대한 자세한 내용을 보려면 Command Lookup Tool(등록된 고객만 해당)을 사용합니다.

호스트-1

```
!
interface FastEthernet0
 switchport access vlan 100
 no ip address
end

!

interface Vlan100
 no ip address
 pppoe enable group global
 pppoe-client dial-pool-number 1
end

!

interface Dialer1
 ip address negotiated
 encapsulation ppp
 dialer pool 1
 ppp chap hostname dsl
 ppp chap password 0 dsl
end

!
```

호스트-2

```
!

interface FastEthernet0
 switchport access vlan 200
 no ip address
end

!

!
interface Vlan200
 no ip address
 pppoe enable group global
 pppoe-client dial-pool-number 1
end

!

!
interface Dialer1
 ip address negotiated
 encapsulation ppp
 dialer pool 1
 ppp chap hostname dsl
 ppp chap password 0 dsl
end
```

```
!
```

스위치

```
SWITCH#sh cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,
                  D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID        Local Intrfce     Holdtme    Capability  Platform  Port ID
SERVER           Gig 0/1           130              R I   ASR1001-X Gig 0/0/0
HOST-1           Fas 0/2           141            R B S I 887G      Fas 0
HOST-2           Fas 0/1           167            R B S I 887       Fas 0



!
interface FastEthernet0/2
 switchport access vlan 100
end

!
interface FastEthernet0/1
 switchport access vlan 200
end

!

!
interface GigabitEthernet0/1
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 100,200
 switchport mode trunk
end

!
```

PPPoE 서버

```
!

username dsl password 0 dsl

!
bba-group pppoe global
 virtual-template 1
!
interface GigabitEthernet0/0/0
 no ip address
 negotiation auto
 cdp enable
 service instance 100 ethernet
  encapsulation dot1q 100 etype pppoe-all
   rewrite ingress tag pop 1 symmetric
  bridge-domain 100
 !
 service instance 200 ethernet
  encapsulation dot1q 200 etype pppoe-all
   rewrite ingress tag pop 1 symmetric
  bridge-domain 200
 !
```

```
!

interface Virtual-Template1
 ip unnumbered Loopback0
 peer default ip address pool POOL
 ppp authentication chap
!
interface BDI100
 no ip address
 pppoe enable group global
!
interface BDI200
 no ip address
 pppoe enable group global
!
interface Loopback0
 ip address 192.168.10.1 255.255.255.255
end

!
ip local pool POOL 192.168.1.1 192.168.1.100

!
```

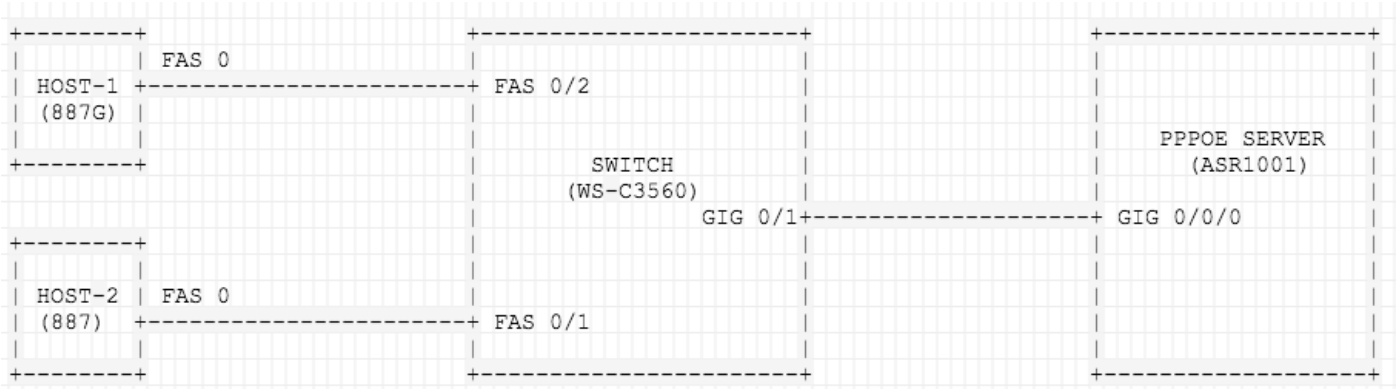
또는 다음과 같이 'vlan-range'를 구성할 수 있습니다.

```
!
interface GigabitEthernet0/0/0
 no ip address
 negotiation auto
 service instance 100 ethernet
 encapsulation default
 bridge-domain 1
 !
end



!
interface BDI1
 no ip address
 vlan-range dot1q 1 4094
 pppoe enable group global
 !
end
```

네트워크 다이어그램



다음을 확인합니다.

이 섹션을 사용하여 컨피그레이션이 제대로 작동하는지 확인합니다.

HOST-1

```
HOST-1#show pppoe session
     1 client session

Uniq ID  PPPoE  RemMAC          Port                      VT  VA         State
           SID  LocMAC                                        VA-st      Type
    N/A      5  00a2.eee6.663f  Vl100                     Di1 Vi2        UP
                c471.fe93.d112                                 UP
```

```
HOST-1#show ip interface brief | exclude un
Interface                  IP-Address      OK? Method Status                Protocol
Dialer1                    192.168.1.4     YES IPCP   up                    up
```

```
HOST-1#show caller ip
  Line           User       IP Address      Local Number    Remote Number   <->
  Vi2            SERVER     192.168.10.1    -               <unknown phone  in
```

```
HOST-1#ping 192.168.10.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
```

```
HOST-1#show ppp interface virtual-Access 2
PPP Serial Context Info
-------------------
Interface        : Vi2
PPP Serial Handle: 0x1F000003
PPP Handle       : 0xB2000003
SSS Handle       : 0x8000004
AAA ID           : 24
Access IE        : 0xA7000003
SHDB Handle      : 0x0
State            : Up
Last State       : Binding
Last Event       : LocalTerm

PPP Session Info
----------------
Interface        : Vi2
PPP ID           : 0xB2000003
Phase            : UP
Stage            : Local Termination
Peer Name        : SERVER
Peer Address     : 192.168.10.1
Control Protocols: LCP[Open] IPCP[Open] CDPCP[Stopped]
Session ID       : 3
AAA Unique ID    : 24
SSS Manager ID   : 0x8000004
SIP ID           : 0x1F000003
PPP_IN_USE       : 0x11
```

```
Vi2 LCP: [Open]
Our Negotiated Options
Vi2 LCP:    MagicNumber 0x7735647E (0x05067735647E)
Peer's Negotiated Options
Vi2 LCP:    MRU 1500 (0x010405DC)
Vi2 LCP:    AuthProto CHAP (0x0305C22305)
Vi2 LCP:    MagicNumber 0xA7A011AC (0x0506A7A011AC)

Vi2 IPCP: [Open]
Our Negotiated Options
Vi2 IPCP:    Address 192.168.1.5 (0x0306C0A80105)
Peer's Negotiated Options
Vi2 IPCP:    Address 192.168.10.1 (0x0306C0A80A01)
```

HOST-2에서

```
HOST-2#show pppoe session
      1 client session

Uniq ID  PPPoE  RemMAC          Port                    VT  VA         State
           SID  LocMAC                                      VA-st      Type
    N/A      6  00a2.eee6.663f  Vl200                   Di1 Vi2        UP
                e8b7.4886.b8ea                              UP
```

```
HOST-2#show ip interface brief | exclude un
Interface                  IP-Address      OK? Method Status                Protocol
Dialer1                    192.168.1.6     YES IPCP   up                    up
```

```
HOST-2#show caller ip
  Line           User       IP Address      Local Number    Remote Number   <->
  Vi2            SERVER     192.168.10.1    -               <unknown phone  in
```

```
HOST-2#ping 192.168.10.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
```

```
HOST-2#show ppp interface virtual-Access 2
PPP Serial Context Info
-------------------
Interface        : Vi2
PPP Serial Handle: 0x7B00000A
PPP Handle       : 0xA000000A
SSS Handle       : 0x4C00000B
AAA ID           : 68
Access IE        : 0x1D00000A
SHDB Handle      : 0x0
State            : Up
Last State       : Binding
Last Event       : LocalTerm

PPP Session Info
---------------
Interface        : Vi2
PPP ID           : 0xA000000A
```

```
Phase            : UP
Stage            : Local Termination
Peer Name        : SERVER
Peer Address     : 192.168.10.1
Control Protocols: LCP[Open] IPCP[Open] CDPCP[Stopped]
Session ID       : 10
AAA Unique ID    : 68
SSS Manager ID   : 0x4C00000B
SIP ID           : 0x7B00000A
PPP_IN_USE       : 0x11

Vi2 LCP: [Open]
Our Negotiated Options
Vi2 LCP:    MagicNumber 0x421AC8AB (0x0506421AC8AB)
Peer's Negotiated Options
Vi2 LCP:    MRU 1500 (0x010405DC)
Vi2 LCP:    AuthProto CHAP (0x0305C22305)
Vi2 LCP:    MagicNumber 0xA7A0942C (0x0506A7A0942C)

Vi2 IPCP: [Open]
Our Negotiated Options
Vi2 IPCP:    Address 192.168.1.6 (0x0306C0A80106)
Peer's Negotiated Options
Vi2 IPCP:    Address 192.168.10.1 (0x0306C0A80A01)
```

스위치

```
SWITCH#show vlan brief

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/4, Fa0/5, Fa0/6, Fa0/7
                                                Fa0/8, Fa0/9, Fa0/10, Fa0/11
                                                Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                                Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                                Fa0/20, Fa0/21, Fa0/22, Fa0/23
                                                Fa0/24, Gi0/2
11   VLAN0011                         active
12   VLAN0012                         active
13   VLAN0013                         active
100  VLAN0100                         active    Fa0/2
200  VLAN0200                         active    Fa0/1



SWITCH#Show interface trunk

Port        Mode             Encapsulation  Status        Native vlan
Gi0/1       on               802.1q         trunking      1

Port        Vlans allowed on trunk
Gi0/1       100,200

Port        Vlans allowed and active in management domain
Gi0/1       100,200

Port        Vlans in spanning tree forwarding state and not pruned
Gi0/1       100,200
```

PPPoE 서버

```
SERVER#show pppoe  session
     2 sessions in LOCALLY_TERMINATED (PTA) State
     2 sessions total

Uniq ID  PPPoE  RemMAC          Port                      VT  VA         State
           SID  LocMAC                                      VA-st      Type
      5      5  c471.fe93.d112  BD100                      1  Vi2.2      PTA
                00a2.eee6.663f                               UP
      6      6  e8b7.4886.b8ea  BD200                      1  Vi2.1      PTA
                00a2.eee6.663f                               UP


SERVER#show caller ip
  Line           User       IP Address      Local Number    Remote Number   <->
  Vi2.1          dsl        192.168.1.6     -               -               in
  Vi2.2          dsl        192.168.1.5     -               -               in


SERVER#show ip local pool POOL
 Pool                    Begin           End             Free  In use
 POOL                    192.168.1.1     192.168.1.100     98       2
Available addresses:
   192.168.1.7
   192.168.1.8
   192.168.1.9

.....

.....
```

'vlan-range'를 사용할 **경우** 'Port'에서 변경 사항을 확인합니다.

```
SERVER#show pppoe session
     2 sessions in LOCALLY_TERMINATED (PTA) State
     2 sessions total

Uniq ID  PPPoE  RemMAC          Port                      VT  VA         State
           SID  LocMAC                                      VA-st      Type
      7      7  c471.fe93.d112  BD1                        1  Vi2.1      PTA
                00a2.eee6.663f  VLAN: 100                    UP
      8      8  e8b7.4886.b8ea  BD1                        1  Vi2.2      PTA
                00a2.eee6.663f  VLAN: 200                    UP


SERVER#show caller ip
 Line           User       IP Address      Local Number    Remote Number   <->
 Vi2.1          dsl        192.168.1.7     -               -               in
 Vi2.2          dsl        192.168.1.8     -               -               in
```

문제 해결

이 섹션에서는 컨피그레이션 문제를 해결하는 데 사용할 수 있는 정보를 제공합니다.

이러한 디버그는 PPP/PPPoE 문제를 해결하는 데 유용합니다.

- 디버그 pppoe 이벤트
- 디버그 pppoe 오류

- 디버그 ppp 협상

관련 정보

- CISCO CSR 1000V에서 BDI를 통한 PPPoE
- 개선 버그 - BDI의 PPPoE 종료 및 ASR1k의 vlan 범위
- 기술 지원 및 문서 – Cisco Systems