

在ASR1k系列路由器上配置通過BDI的PPPoE

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簡介

本文說明如何使用橋接網域介面(BDI)和vlan範圍設定乙太網路上的點對點通訊協定(PPPoE)伺服器。

必要條件

需求

思科建議您瞭解以下主題：

- 端到端第1層連線正常
- PPP和PPPoE的基本知識已完全瞭解

採用元件

本文中的資訊係根據以下軟體和硬體版本：

- 主機1 - CISCO887G
- 主機2 - CISCO887
- 交換機 — WS-C3560-24TS-S
- PPPoE伺服器 — ASR1001-X

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

附註：使用[命令查詢工具](#)(僅供已註冊客戶使用)可獲取本節中使用的命令的更多資訊。

主機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
```

主機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
```

交換器

```
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伺服器

```
!  
  
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

```

或者，您可以配置「vlan-range」，如下所示：

```

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

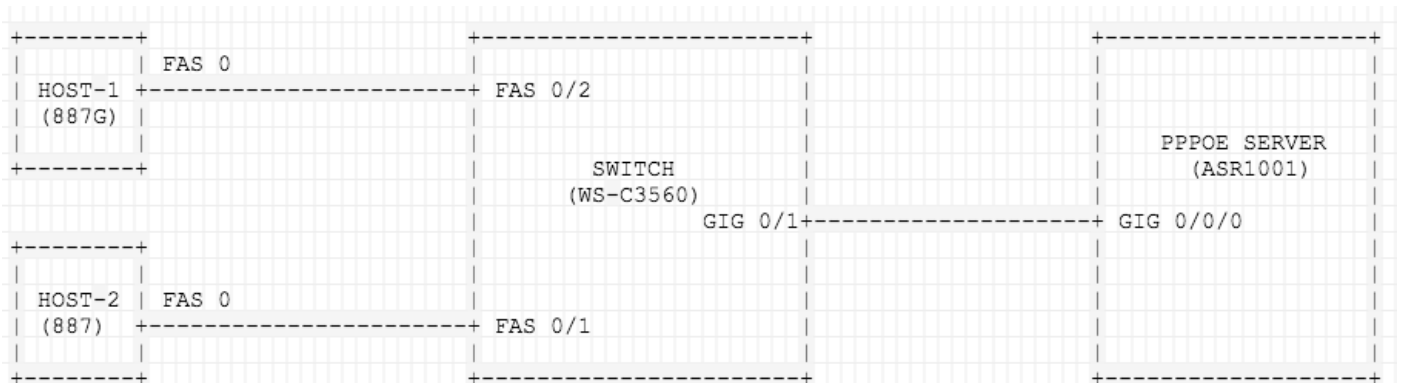
```

```

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

```

網路圖表



驗證

使用本節內容，確認您的組態是否正常運作。

在HOST-1上

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

| Uniq ID | PPPoE SID | RemMAC LocMAC | Port | VT | VA VA-st Vi2 | State Type |
|---------|-----------|-------------------------------|-------|-----|--------------|------------|
| N/A | 5 | 00a2.eee6.663f c471.fe93.d112 | Vl100 | Di1 | Vi2 | 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     : 0x80000004
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 : 0x80000004
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)
```

在HOST-2上

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

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

在交換機上

```
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 |

在PPPoE伺服器上

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

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

```
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
```

```
.....
```

```
.....
```

使用「vlan-range」時，請注意「Port」中的更改：

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

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

```
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 |

疑難排解

本節提供的資訊可用於對組態進行疑難排解。

這些調試有助於排除PPP/PPPoE故障。

- debug pppoe events
- debug pppoe errors

- debug ppp negotiation

相關資訊

- [CISCO CSR 1000V上使用BDI的PPPoE](#)
- [增強漏洞 — BDI上的PPPoE終端和ASR1k上的vlan範圍](#)
- [技術支援與文件 - Cisco Systems](#)