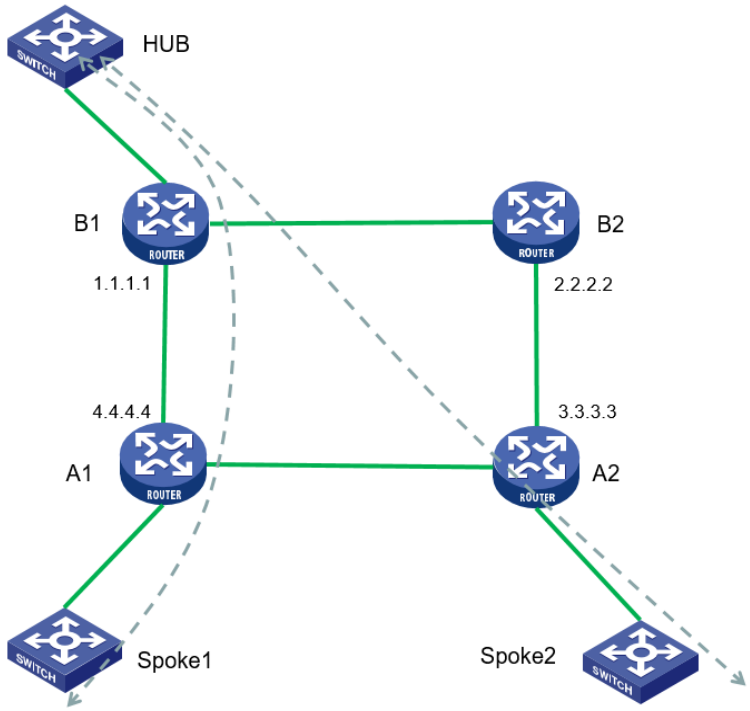
IPRAN组网政企专线业务典型配置—点到多点（1）

IP-RAN 何理 2015-11-05 发表

某地市已经部署了我司IPRAN环网，现在客户希望在环网上增加某政企客户的二层专线业务，从而实现该客户同城总部与两个办公楼之间的业务二层互通。分支之间无流量互访要求。



如图所示，总部CE设备挂在B1设备上，两个分支节点分别位于A1/A2下；要求实现总部与分支之间的互访，分支之间无互访需求；

实现该需求有两种配置方法：

1. B1使用VLL方式，分别于A1/A2建立两个PW，实现使用点到点的VLL进行互通，该方式配置详见VLL配置指导；该方式如果分支较多，B1上的配置会较多；
2. B1还可以使用VPLS方式，与A1/A2建立点到多点的PW，实现总部分支点到多点互通；下面主要介绍下该方式配置方法：

进介绍关键业务配置，配置点到多点L2VPN业务之前，请先确保IPRAN环网上路由可达，MPLS及MPLS LDP已经使能；

B1配置

l2vpn enable
#
pw-class vpls
 pw-type ethernet
 vccv cc router-alert
 vccv bfd
#
vsi hub
 pwsignaling ldp
  peer 3.3.3.3 pw-id 13 pw-class vpls
  peer 4.4.4.4 pw-id 14 pw-class vpls
#
interface GigabitEthernet0/0
 port link-mode route
 combo enable copper
 xconnect vsi hub

A1配置

```
 l2vpn enable
#
pw-class vpls
 pw-type ethernet
 vccv cc router-alert
 vccv bfd

xconnect-group 1
 connection 1
  ac interface GigabitEthernet0/2
  peer 1.1.1.1 pw-id 14 pw-class vpls

interface GigabitEthernet0/2
 port link-mode route
 combo enable
```

A2配置

```
l2vpn enable
#
pw-class vpls
 pw-type ethernet
 vccv cc router-alert
 vccv bfd
#
xconnect-group 1
 connection 1
  ac interface GigabitEthernet0/2
  peer 1.1.1.1 pw-id 13 pw-class vpls

interface GigabitEthernet0/2
 port link-mode route
 combo enable copper
```

业务验证：

HUB地址：192.168.1.1　Spoke1:192.168.1.2　Spoke2:192.168.1.3

总部ping分支互通正常：

```
<HUB>ping 192.168.1.3
Ping 192.168.1.3 (192.168.1.3): 56 data bytes, press CTRL_C to break
56 bytes from 192.168.1.3: icmp_seq=0 ttl=255 time=2.761 ms
56 bytes from 192.168.1.3: icmp_seq=1 ttl=255 time=2.779 ms
56 bytes from 192.168.1.3: icmp_seq=2 ttl=255 time=1.766 ms
56 bytes from 192.168.1.3: icmp_seq=3 ttl=255 time=2.419 ms
56 bytes from 192.168.1.3: icmp_seq=4 ttl=255 time=3.031 ms

--- Ping statistics for 192.168.1.3 ---
5 packets transmitted, 5 packets received, 0.0% packet loss
round-trip min/avg/max/std-dev = 1.766/2.551/3.031/0.438 ms
<HUB>%Nov  4 07:57:59:275 2015 HUB PING/6/PING_STATISTICS: Ping statist
ted, 5 packets received, 0.0% packet loss, round-trip min/avg/max/std-d
ping 192.168.1.2
Ping 192.168.1.2 (192.168.1.2): 56 data bytes, press CTRL_C to break
56 bytes from 192.168.1.2: icmp_seq=0 ttl=255 time=1.637 ms
56 bytes from 192.168.1.2: icmp_seq=1 ttl=255 time=1.980 ms
56 bytes from 192.168.1.2: icmp_seq=2 ttl=255 time=1.862 ms
56 bytes from 192.168.1.2: icmp_seq=3 ttl=255 time=1.276 ms
56 bytes from 192.168.1.2: icmp_seq=4 ttl=255 time=1.687 ms

--- Ping statistics for 192.168.1.2 ---
5 packets transmitted, 5 packets received, 0.0% packet loss
round-trip min/avg/max/std-dev = 1.276/1.688/1.980/0.240 ms
```

分支Spoke1 ping HUB正常，分支之间无法互访：

```
<H3C>ping 192.168.1.1
Ping 192.168.1.1 (192.168.1.1): 56 data bytes, press CTRL_C to brea
56 bytes from 192.168.1.1: icmp_seq=0 ttl=255 time=3.000 ms
56 bytes from 192.168.1.1: icmp_seq=1 ttl=255 time=1.000 ms
56 bytes from 192.168.1.1: icmp_seq=2 ttl=255 time=2.000 ms
56 bytes from 192.168.1.1: icmp_seq=3 ttl=255 time=2.000 ms
56 bytes from 192.168.1.1: icmp_seq=4 ttl=255 time=1.000 ms

--- Ping statistics for 192.168.1.1 ---
5 packets transmitted, 5 packets received, 0.0% packet loss
round-trip min/avg/max/std-dev = 1.000/1.800/3.000/0.748 ms
<H3C>%Nov  4 07:27:22:490 2015 H3C PING/6/PING_STATISTICS: Ping sta
ted, 5 packets received, 0.0% packet loss, round-trip min/avg/max/s
ping 192.168.1.3
Ping 192.168.1.3 (192.168.1.3): 56 data bytes, press CTRL_C to brea
Request time out
Request time out
Request time out
Request time out
Request time out

--- Ping statistics for 192.168.1.3 ---
5 packets transmitted, 0 packets received, 100.0% packet loss
```

分支Spoke2 ping HUB正常，分支之间无法互访：

```
<H3C>ping 192.168.1.1
Ping 192.168.1.1 (192.168.1.1): 56 data bytes, press CTRL_C to break
56 bytes from 192.168.1.1: icmp_seq=0 ttl=255 time=3.000 ms
56 bytes from 192.168.1.1: icmp_seq=1 ttl=255 time=2.000 ms
56 bytes from 192.168.1.1: icmp_seq=2 ttl=255 time=2.000 ms
56 bytes from 192.168.1.1: icmp_seq=3 ttl=255 time=3.000 ms
56 bytes from 192.168.1.1: icmp_seq=4 ttl=255 time=3.000 ms

--- Ping statistics for 192.168.1.1 ---
5 packets transmitted, 5 packets received, 0.0% packet loss
round-trip min/avg/max/std-dev = 2.000/2.600/3.000/0.490 ms
<H3C>%Nov  4 09:08:08:136 2015 H3C PING/6/PING_STATISTICS: Ping statistics for 192.168
ted, 5 packets received, 0.0% packet loss, round-trip min/avg/max/std-dev = 2.000/2.60
ping 192.168.1.2
Ping 192.168.1.2 (192.168.1.2): 56 data bytes, press CTRL_C to break
Request time out

--- Ping statistics for 192.168.1.2 ---
2 packets transmitted, 0 packets received, 100.0% packet loss
```

在B1上查看PW状态：

```
[B1]dis l2v pw
Flags: M - main, B - backup, H - hub link, S - spoke link, N - no split horizon
Total number of PWs: 2
2 up, 0 blocked, 0 down, 0 defect, 0 idle, 0 duplicate

VSI Name: vpls
Peer            PW ID/Rmt Site    In/Out Label    Proto   Flag  Link ID  State
3.3.3.3         13                917631/917631   LDP     M     8        Up
4.4.4.4         14                917630/917631   LDP     M     9        Up
```

在B1上查看VPLS详细信息状态：

```
[B1]dis l2v vsi name vpls verbose
VSI Name: vpls
  VSI Index               : 0
  VSI State               : Up
  MTU                     : 1500
  Bandwidth               : -
  Broadcast Restrain      : -
  Multicast Restrain      : -
  Unknown Unicast Restrain: -
  MAC Learning            : Enabled
  MAC Table Limit         : -
  MAC Learning rate       : -
  Drop Unknown            : -
  Flooding                : Enabled
  VXLAN ID                : -
  LDP PWs:
    Peer            PW ID           Link ID    State
    3.3.3.3         13              8          Up
    4.4.4.4         14              9          Up
  ACs:
    AC                              Link ID    State
    GE0/0                           0          Up
```

在B1上查看VPLS MAC地址转发表：

```
[B1]display l2vpn mac-address
MAC Address      State    VSI Name                        Link ID/Name  Aging
189f-4404-0500   Dynamic  vpls                            0             Aging
189f-4404-0502   Dynamic  vpls                            0             Aging
189f-4cf4-0602   Dynamic  vpls                            9             Aging
189f-563b-0702   Dynamic  vpls                            8             Aging
--- 4 mac address(es) found  ---
```

A1/A2相关状态再此不在查看

1. 配置L2VPN是需要考虑PW封装以及AC接入类型，不通的组合会对报文的Tag产生不同的影响；
2. 配置VPLS业务前，首先要保证IPRAN环网路由可达，公网MPLS隧道正常建立；
3. 无特殊需求IPRAN网络重均采用Martini方式及LDP作为L2VPN信令协议；
4. 本文配置实例，B1采用VPLS配置与A设备VLL对接；