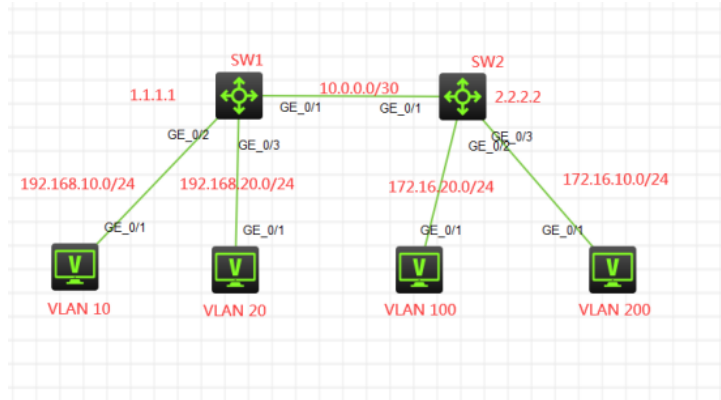


### 组网及说明

网络拓扑图如下：



组网说明：

本案例采用H3C HCL模拟器来模拟多vpn-instance实例RIP典型组网配置，为了实现不同VLAN之间通过不同的vpn实例进行隔离，因此采用多vpn实例捆绑到相应的VLAN。

VLAN 400与用于在SW1、SW2的vpn-rt互联使用，VLAN 500用于SW1、SW2的vpn-nrt互联使用。由于VLAN 400与VLAN 500绑定到了不同的VPN实例，因此可以共同使用10.0.0.0/30作为互联地址。业务地址、互联地址、Loopback地址如拓扑图所示。其中VLAN 10、VLAN 100属于vpn-rt中，VLAN 20、VLAN 200属于vpn-nrt实例中，另外SW1与SW2之间的互联采用trunk，互联的VLAN使用VLAN 400（绑定到vpn-rt）和VLAN 500（绑定到vpn-nrt），全网采用多VPN实例RIP互联互通，不通VPN实例的业务地址不能互通。

vpn-rt规划如下：

RD:100:1

RT:100:1

vpn-nrt规划如下：

RD:200:1

RT:200:1

### 配置步骤

- 1、分别在SW1和SW2创建VPN实例
- 2、根据组网说明将各业务地址、互联地址、loopback绑定到vpn实例
- 3、创建多实例RIP，并发布业务地址实现互通
- 4、SW1与SW2之间的互联采用trunk，仅允许互联的VLAN互通。

### 配置关键点

SW1：

```

sys
[H3C]sysname SW1
#创建vpn-rt实例，并配置RD值和RT值
[SW1]ip vpn-instance vpn-rt
[SW1-vpn-instance-vpn-rt]route-distinguisher 100:1
[SW1-vpn-instance-vpn-rt]vpn-target 100:1
[SW1-vpn-instance-vpn-rt]quit
#创建vpn-nrt实例，并配置RD值和RT值
[SW1]ip vpn-instance vpn-nrt
[SW1-vpn-instance-vpn-nrt]route-distinguisher 200:1
[SW1-vpn-instance-vpn-nrt]vpn-target 200:1
[SW1-vpn-instance-vpn-nrt]quit
[SW1]int LoopBack 0
[SW1-LoopBack0]ip binding vpn-instance vpn-rt //将Loopback0绑定到vpn-rt
Some configurations on the interface are removed.
[SW1-LoopBack0]ip address 1.1.1.1 32
[SW1-LoopBack0]quit
[SW1]int LoopBack 1
[SW1-LoopBack1]ip binding vpn-instance vpn-nrt //将Loopback1绑定到vpn-nrt
    
```

Some configurations on the interface are removed.

```
[SW1-LoopBack1]ip address 1.1.1.1 32
```

```
[SW1-LoopBack1]quit
```

```
[SW1]vlan 10
```

```
[SW1-vlan10]quit
```

```
[SW1]vlan 20
```

```
[SW1-vlan20]quit
```

```
[SW1]vlan 400
```

```
[SW1-vlan400]quit
```

```
[SW1]vlan 500
```

```
[SW1-vlan500]quit
```

```
[SW1]int vlan 10
```

```
[SW1-Vlan-interface10]ip binding vpn-instance vpn-rt //将VLAN 10绑定到vpn-rt
```

Some configurations on the interface are removed.

```
[SW1-Vlan-interface10]ip address 192.168.10.1 24
```

```
[SW1-Vlan-interface10]quit
```

```
[SW1]int vlan 20
```

```
[SW1-Vlan-interface20]ip binding vpn-instance vpn-nrt //将VLAN 20绑定到vpn-nrt
```

Some configurations on the interface are removed.

```
[SW1-Vlan-interface20]ip address 192.168.20.1 24
```

```
[SW1-Vlan-interface20]quit
```

```
[SW1]int vlan 400
```

```
[SW1-Vlan-interface400]ip binding vpn-instance vpn-rt //将VLAN400绑定到vpn-rt
```

Some configurations on the interface are removed.

```
[SW1-Vlan-interface400]description
```

```
[SW1-Vlan-interface400]ip address 10.0.0.1 30
```

```
[SW1-Vlan-interface400]quit
```

```
[SW1]int vlan 500
```

```
[SW1-Vlan-interface500]ip binding vpn-instance vpn-nrt //将VLAN 500绑定到vpn-nrt
```

Some configurations on the interface are removed.

```
[SW1-Vlan-interface500]description
```

```
[SW1-Vlan-interface500]ip address 10.0.0.1 30
```

```
[SW1-Vlan-interface500]quit
```

```
[SW1]
```

```
[SW1]int gi 1/0/2
```

```
[SW1-GigabitEthernet1/0/2]port link-type access
```

```
[SW1-GigabitEthernet1/0/2]port access vlan 10
```

```
[SW1-GigabitEthernet1/0/2]quit
```

```
[SW1]int gi 1/0/3
```

```
[SW1-GigabitEthernet1/0/3]port link-type access
```

```
[SW1-GigabitEthernet1/0/3]port access vlan 20
```

```
[SW1-GigabitEthernet1/0/3]quit
```

```
[SW1]
```

```
[SW1]int gi 1/0/1
```

```
[SW1-GigabitEthernet1/0/1]description
```

```
[SW1-GigabitEthernet1/0/1]port link-type trunk
```

```
[SW1-GigabitEthernet1/0/1]undo port trunk permit vlan 1
```

```
[SW1-GigabitEthernet1/0/1]port trunk permit vlan 400 500
```

```
[SW1-GigabitEthernet1/0/1]quit
```

```
[SW1]rip 10 vpn-instance vpn-rt //将RIP 10绑定到vpn-rt
```

```
[SW1-rip-10]version 2
```

```
[SW1-rip-10]network 10.0.0.0
```

```
[SW1-rip-10]network 1.1.1.1
```

```
[SW1-rip-10]network 192.168.10.0
```

```
[SW1-rip-10]quit
```

```
[SW1]rip 20 vpn-instance vpn-nrt //将RIP 20绑定到vpn-nrt
```

```
[SW1-rip-20]version 2
```

```
[SW1-rip-20]network 10.0.0.0
```

```
[SW1-rip-20]network 1.1.1.1
[SW1-rip-20]network 192.168.20.0
[SW1-rip-20]quit
```

SW2:

```
sys
[H3C]sysname SW2
[SW2]ip vpn-instance vpn-rt
[SW2-vpn-instance-vpn-rt]route-distinguisher 100:1
[SW2-vpn-instance-vpn-rt]vpn-target 100:1
[SW2-vpn-instance-vpn-rt]quit
[SW2]ip vpn-instance vpn-nrt
[SW2-vpn-instance-vpn-nrt]route-distinguisher 200:1
[SW2-vpn-instance-vpn-nrt]vpn-target 200:1
[SW2-vpn-instance-vpn-nrt]quit
[SW2]int LoopBack 0
[SW2-LoopBack0]ip binding vpn-instance vpn-rt
Some configurations on the interface are removed.
[SW2-LoopBack0]ip address 2.2.2.2 32
[SW2-LoopBack0]quit
[SW2]int LoopBack 1
[SW2-LoopBack1]ip binding vpn-instance vpn-nrt
Some configurations on the interface are removed.
[SW2-LoopBack1]ip address 2.2.2.2 32
[SW2-LoopBack1]quit
[SW2]vlan 100
[SW2-vlan100]quit
[SW2]vlan 200
[SW2-vlan200]quit
[SW2]vlan 400
[SW2-vlan400]quit
[SW2]vlan 500
[SW2-vlan500]quit
[SW2]int vlan 100
[SW2-Vlan-interface100]ip binding vpn-instance vpn-rt
Some configurations on the interface are removed.
[SW2-Vlan-interface100]ip address 172.16.20.1 24
[SW2-Vlan-interface100]quit
[SW2]int vlan 200
[SW2-Vlan-interface200]ip binding vpn-instance vpn-nrt
Some configurations on the interface are removed.
[SW2-Vlan-interface200]ip address 172.16.10.1 24
[SW2-Vlan-interface200]quit
[SW2]int vlan 400
[SW2-Vlan-interface400]ip binding vpn-instance vpn-rt
Some configurations on the interface are removed.
[SW2-Vlan-interface400]description
[SW2-Vlan-interface400]ip address 10.0.0.2 30
[SW2-Vlan-interface400]quit
[SW2]int vlan 500
[SW2-Vlan-interface500]ip binding vpn-instance vpn-nrt
Some configurations on the interface are removed.
[SW2-Vlan-interface500]description
[SW2-Vlan-interface500]ip address 10.0.0.2 30
[SW2-Vlan-interface500]quit
[SW2]int gi 1/0/2
[SW2-GigabitEthernet1/0/2]port link-type access
[SW2-GigabitEthernet1/0/2]port access vlan 100
[SW2-GigabitEthernet1/0/2]quit
[SW2]int gi 1/0/3
[SW2-GigabitEthernet1/0/3]port link-type access
[SW2-GigabitEthernet1/0/3]port access vlan 200
[SW2-GigabitEthernet1/0/3]quit
[SW2]int gi 1/0/1
```

```
[SW2-GigabitEthernet1/0/1]description
[SW2-GigabitEthernet1/0/1]port link-type trunk
[SW2-GigabitEthernet1/0/1]undo port trunk permit vlan 1
[SW2-GigabitEthernet1/0/1]port trunk permit vlan 400 500
[SW2-GigabitEthernet1/0/1]quit
```

```
[SW2]rip 10 vpn-instance vpn-rt
[SW2-rip-10]version 2
[SW2-rip-10]network 10.0.0.0
[SW2-rip-10]network 2.2.2.2
[SW2-rip-10]network 172.16.0.0
[SW2-rip-10]quit
```

```
[SW2]rip 20 vpn-instance vpn-nrt
[SW2-rip-20]version 2
[SW2-rip-20]network 10.0.0.0
[SW2-rip-20]network 2.2.2.2
[SW2-rip-20]network 172.16.0.0
[SW2-rip-20]quit
```

查看VPN路由表确认各VPN发布的路由已学习到:

```
[SW1]dis ip routing-table vpn-instance vpn-rt
```

Destinations : 19      Routes : 19

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
0.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
1.1.1.1/32	Direct	0	0	127.0.0.1	InLoop0
2.0.0.0/8	RIP	100	1	10.0.0.2	Vlan400
10.0.0.0/30	Direct	0	0	10.0.0.1	Vlan400
10.0.0.0/32	Direct	0	0	10.0.0.1	Vlan400
10.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
10.0.0.3/32	Direct	0	0	10.0.0.1	Vlan400
127.0.0.0/8	Direct	0	0	127.0.0.1	InLoop0
127.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
127.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
127.255.255.255/32	Direct	0	0	127.0.0.1	InLoop0
172.16.0.0/16	RIP	100	1	10.0.0.2	Vlan400
192.168.10.0/24	Direct	0	0	192.168.10.1	Vlan10
192.168.10.0/32	Direct	0	0	192.168.10.1	Vlan10
192.168.10.1/32	Direct	0	0	127.0.0.1	InLoop0
192.168.10.255/32	Direct	0	0	192.168.10.1	Vlan10
224.0.0.0/4	Direct	0	0	0.0.0.0	NULL0
224.0.0.0/24	Direct	0	0	0.0.0.0	NULL0
255.255.255.255/32	Direct	0	0	127.0.0.1	InLoop0

[SW1]

```
[SW1]dis ip routing-table vpn-instance vpn-nrt
```

Destinations : 19      Routes : 19

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
0.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
1.1.1.1/32	Direct	0	0	127.0.0.1	InLoop0
2.0.0.0/8	RIP	100	1	10.0.0.2	Vlan500
10.0.0.0/30	Direct	0	0	10.0.0.1	Vlan500
10.0.0.0/32	Direct	0	0	10.0.0.1	Vlan500
10.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
10.0.0.3/32	Direct	0	0	10.0.0.1	Vlan500
127.0.0.0/8	Direct	0	0	127.0.0.1	InLoop0
127.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
127.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
127.255.255.255/32	Direct	0	0	127.0.0.1	InLoop0
172.16.0.0/16	RIP	100	1	10.0.0.2	Vlan500

```

192.168.20.0/24 Direct 0 0 192.168.20.1 Vlan20
192.168.20.0/32 Direct 0 0 192.168.20.1 Vlan20
192.168.20.1/32 Direct 0 0 127.0.0.1 InLoop0
192.168.20.255/32 Direct 0 0 192.168.20.1 Vlan20
224.0.0.0/4 Direct 0 0 0.0.0.0 NULL0
224.0.0.0/24 Direct 0 0 0.0.0.0 NULL0
255.255.255.255/32 Direct 0 0 127.0.0.1 InLoop0
[SW1]

```

```
[SW2]dis ip routing-table vpn-instance vpn-rt
```

```
Destinations : 19 Routes : 19
```

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
0.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
1.0.0.0/8	RIP	100	1	10.0.0.1	Vlan400
2.2.2.2/32	Direct	0	0	127.0.0.1	InLoop0
10.0.0.0/30	Direct	0	0	10.0.0.2	Vlan400
10.0.0.0/32	Direct	0	0	10.0.0.2	Vlan400
10.0.0.2/32	Direct	0	0	127.0.0.1	InLoop0
10.0.0.3/32	Direct	0	0	10.0.0.2	Vlan400
127.0.0.0/8	Direct	0	0	127.0.0.1	InLoop0
127.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
127.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
127.255.255.255/32	Direct	0	0	127.0.0.1	InLoop0
172.16.20.0/24	Direct	0	0	172.16.20.1	Vlan100
172.16.20.0/32	Direct	0	0	172.16.20.1	Vlan100
172.16.20.1/32	Direct	0	0	127.0.0.1	InLoop0
172.16.20.255/32	Direct	0	0	172.16.20.1	Vlan100
192.168.10.0/24	RIP	100	1	10.0.0.1	Vlan400
224.0.0.0/4	Direct	0	0	0.0.0.0	NULL0
224.0.0.0/24	Direct	0	0	0.0.0.0	NULL0
255.255.255.255/32	Direct	0	0	127.0.0.1	InLoop0

```
[SW2]
```

```
[SW2]dis ip routing-table vpn-instance vpn-nrt
```

```
Destinations : 19 Routes : 19
```

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
0.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
1.0.0.0/8	RIP	100	1	10.0.0.1	Vlan500
2.2.2.2/32	Direct	0	0	127.0.0.1	InLoop0
10.0.0.0/30	Direct	0	0	10.0.0.2	Vlan500
10.0.0.0/32	Direct	0	0	10.0.0.2	Vlan500
10.0.0.2/32	Direct	0	0	127.0.0.1	InLoop0
10.0.0.3/32	Direct	0	0	10.0.0.2	Vlan500
127.0.0.0/8	Direct	0	0	127.0.0.1	InLoop0
127.0.0.0/32	Direct	0	0	127.0.0.1	InLoop0
127.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
127.255.255.255/32	Direct	0	0	127.0.0.1	InLoop0
172.16.10.0/24	Direct	0	0	172.16.10.1	Vlan200
172.16.10.0/32	Direct	0	0	172.16.10.1	Vlan200
172.16.10.1/32	Direct	0	0	127.0.0.1	InLoop0
172.16.10.255/32	Direct	0	0	172.16.10.1	Vlan200
192.168.20.0/24	RIP	100	1	10.0.0.1	Vlan500
224.0.0.0/4	Direct	0	0	0.0.0.0	NULL0
224.0.0.0/24	Direct	0	0	0.0.0.0	NULL0
255.255.255.255/32	Direct	0	0	127.0.0.1	InLoop0

```
[SW2]
```

分别查看各RIP的信息:

```
[SW2]dis rip
```

```
Private VPN-instance name: vpn-rt
```

RIP process: 10  
RIP version: 2  
Preference: 100  
Checkzero: Enabled  
Default cost: 0  
Summary: Enabled  
Host routes: Enabled  
Maximum number of load balanced routes: 16  
Update time : 30 secs Timeout time : 180 secs  
Suppress time : 120 secs Garbage-collect time : 120 secs  
Update output delay: 20(ms) Output count: 3  
Graceful-restart interval: 60 secs  
Triggered Interval : 5 50 200  
BFD: Disabled  
Silent interfaces: None  
Default routes: Disabled  
Verify-source: Enabled  
Networks:  
2.0.0.0 10.0.0.0  
172.16.0.0  
Configured peers: None  
Triggered updates sent: 3  
Number of routes changes: 5  
Number of replies to queries: 0

Private VPN-instance name: vpn-nrt

RIP process: 20  
RIP version: 2  
Preference: 100  
Checkzero: Enabled  
Default cost: 0  
Summary: Enabled  
Host routes: Enabled  
Maximum number of load balanced routes: 16  
Update time : 30 secs Timeout time : 180 secs  
Suppress time : 120 secs Garbage-collect time : 120 secs  
Update output delay: 20(ms) Output count: 3  
Graceful-restart interval: 60 secs  
Triggered Interval : 5 50 200  
BFD: Disabled  
Silent interfaces: None  
Default routes: Disabled  
Verify-source: Enabled  
Networks:  
2.0.0.0 10.0.0.0  
172.16.0.0  
Configured peers: None  
Triggered updates sent: 3  
Number of routes changes: 5  
Number of replies to queries: 0

[SW2]

[SW1]dis rip

Private VPN-instance name: vpn-rt

RIP process: 10  
RIP version: 2  
Preference: 100  
Checkzero: Enabled  
Default cost: 0  
Summary: Enabled  
Host routes: Enabled  
Maximum number of load balanced routes: 16  
Update time : 30 secs Timeout time : 180 secs  
Suppress time : 120 secs Garbage-collect time : 120 secs  
Update output delay: 20(ms) Output count: 3

Graceful-restart interval: 60 secs  
 Triggered Interval : 5 50 200  
 BFD: Disabled  
 Silent interfaces: None  
 Default routes: Disabled  
 Verify-source: Enabled  
 Networks:  
   1.0.0.0           10.0.0.0  
   192.168.10.0  
 Configured peers: None  
 Triggered updates sent: 5  
 Number of routes changes: 5  
 Number of replies to queries: 1  
 Private VPN-instance name: vpn-nrt  
 RIP process: 20  
 RIP version: 2  
 Preference: 100  
 Checkzero: Enabled  
 Default cost: 0  
 Summary: Enabled  
 Host routes: Enabled  
 Maximum number of load balanced routes: 16  
 Update time : 30 secs Timeout time : 180 secs  
 Suppress time : 120 secs Garbage-collect time : 120 secs  
 Update output delay: 20(ms) Output count: 3  
 Graceful-restart interval: 60 secs  
 Triggered Interval : 5 50 200  
 BFD: Disabled  
 Silent interfaces: None  
 Default routes: Disabled  
 Verify-source: Enabled  
 Networks:  
   1.0.0.0           10.0.0.0  
   192.168.20.0  
 Configured peers: None  
 Triggered updates sent: 5  
 Number of routes changes: 5  
 Number of replies to queries: 1

[SW1]

PC填写相应IP地址，同VPN实例的能PING通，不同VPN实例的不能PING通



配置PC\_5

接口	状态	IPv4地址	IPv6地址
G0/0/1	UP	192.168.20.2/24	

刷新

接口管理  
 禁用  启用

IPv4配置：  
 DHCP  
 静态

IPv4地址：  
掩码地址：  
IPv4网关：

启用

配置PC\_6

接口	状态	IPv4地址	IPv6地址
G0/0/1	UP	172.16.20.2/24	

刷新

接口管理  
 禁用  启用

IPv4配置：  
 DHCP  
 静态

IPv4地址：  
掩码地址：  
IPv4网关：

启用

配置PC\_4

接口	状态	IPv4地址	IPv6地址
G0/0/1	UP	172.16.10.2/24	

刷新

接口管理  
 禁用  启用

IPv4配置：  
 DHCP  
 静态

IPv4地址：  
掩码地址：  
IPv4网关：

启用

同VPN实例能互通，不同VPN实例不能PING通



