

MSR 系列路由器 PIM-SM C-BSR 和 C-RP 功能的配置举例

目 录

1 简介	1
2 配置前提	1
3 配置举例	1
3.1 组网需求	1
3.2 配置思路	2
3.3 使用版本	2
3.4 配置注意事项	2
3.5 配置步骤	3
3.5.1 Router A的配置	3
3.5.2 Router B的配置	3
3.5.3 Router C的配置	4
3.6 验证配置	4
3.7 配置文件	7
4 相关资料	9

1 简介

本文档介绍 PIM-SM C-BSR 和 C-RP 功能的配置。

2 配置前提

本文档不严格与具体软、硬件版本对应，如果使用过程中与产品实际情况有差异，请参考相关产品手册，或以设备实际情况为准。

本文档中的配置均是在实验室环境下进行的配置和验证，配置前设备的所有参数均采用出厂时的缺省配置。如果您已经对设备进行了配置，为了保证配置效果，请确认现有配置和以下举例中的配置不冲突。

本文档假设您已了解 PIM-SM 特性。

3 配置举例

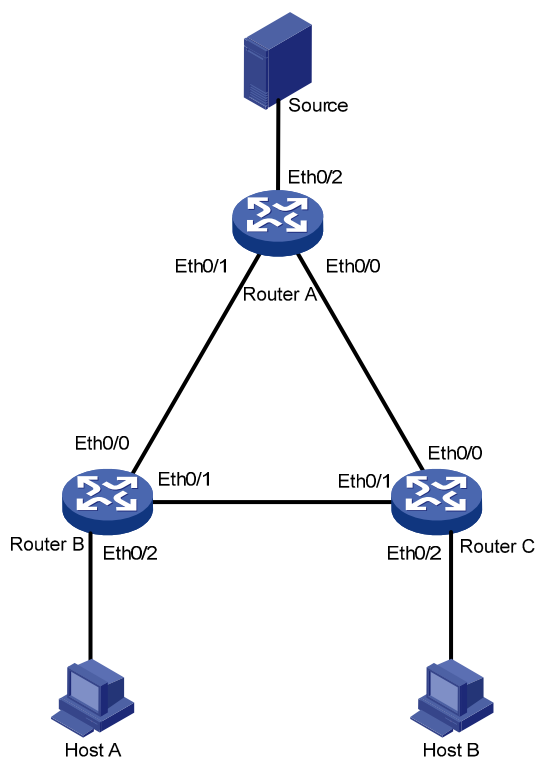
3.1 组网需求

如[图1](#)所示，Router A连接组播源，Router B和Router C各连接一台组播接收者，三台MSR设备两两相连。

现要求通过配置 PIM SM 实现：

- 组播接收者收到组播源发送的组播组；
- PIM SM 的 C-BSR 和 C-RP 功能。

图1 PIM-SM 配置组网图



设备	接口	IP地址	设备	接口	IP地址
Router A	Eth0/0	192.168.0.1/24	Router C	Eth0/0	192.168.0.2/24
	Eth0/1	10.0.1.1/24		Eth0/1	192.168.2.2/24
	Eth0/2	192.168.1.1/24		Eth0/2	10.0.3.1/24
Router B	Eth0/0	192.168.1.2/24	Host A		10.0.2.2/24
	Eth0/1	192.168.2.1/24	Host B		10.0.3.2/24
	Eth0/2	10.0.2.1/24	Source		10.0.1.2/24

3.2 配置思路

- 各路由器使能 OSPF，使各路由器之间能够借助单播路由协议实现动态路由更新。
- 为使组播接收者接收组播数据全局启动组播，配置 C-BSR 与 C-RP，并在连接组播接收者的路由器接口使能 IGMP。

3.3 使用版本

本举例是在 Release 2317 版本上进行配置和验证的。

3.4 配置注意事项

- 配置 PIM-SM 域内的各路由器之间采用 OSPF 协议进行互连，确保 PIM-SM 域中 Router A、Router B、Router C 之间能够在网络层互通，并且各路由器之间能够借助单播路由协议实现动态路由更新；
- 在连接末梢网络的接口使能 IGMP 协议。

3.5 配置步骤

3.5.1 Router A的配置

```
<RouterA> system-view
# 全局开启组播

[RouterA] multicast routing-enable
[RouterA] interface ethernet 0/0
[RouterA-Ethernet0/0] ip address 192.168.0.1 24
[RouterA-Ethernet0/0] pim sm
[RouterA-Ethernet0/0] quit
[RouterA] interface ethernet 0/1
[RouterA-Ethernet0/1] ip address 192.168.1.1 24
[RouterA-Ethernet0/1] pim sm
[RouterA-Ethernet0/1] quit
[RouterA] interface ethernet 0/2
[RouterA-Ethernet0/2] ip address 10.0.1.1 24
[RouterA-Ethernet0/2] pim sm
[RouterA-Ethernet0/2] quit
# 配置 OSPF

[RouterA] ospf 1
[RouterA-ospf-1] area 0.0.0.0
[RouterA-ospf-1-area-0.0.0.0] network 192.168.0.0 0.0.0.255
[RouterA-ospf-1-area-0.0.0.0] network 192.168.1.0 0.0.0.255
[RouterA-ospf-1-area-0.0.0.0] network 10.0.1.0 0.0.0.255
[RouterA-ospf-1-area-0.0.0.0] quit
[RouterA-ospf-1] quit
```

3.5.2 Router B的配置

```
<RouterB> system-view
# 全局开启组播

[RouterB] multicast routing-enable
[RouterB] interface ethernet 0/0
[RouterB-Ethernet0/0] ip address 192.168.1.2 24
[RouterB-Ethernet0/0] pim sm
[RouterB-Ethernet0/0] quit
[RouterB] interface ethernet 0/1
[RouterB-Ethernet0/1] ip address 192.168.2.1 24
[RouterB-Ethernet0/1] pim sm
[RouterB-Ethernet0/1] quit
[RouterB] interface ethernet 0/2
[RouterB-Ethernet0/2] ip address 10.0.2.1 24
[RouterB-Ethernet0/2] igmp enable
[RouterB-Ethernet0/2] quit
# 配置 OSPF

[RouterB] ospf 1
```

```
[RouterB-ospf-1] area 0.0.0.0
[RouterB-ospf-1-area-0.0.0.0] network 192.168.1.0 0.0.0.255
[RouterB-ospf-1-area-0.0.0.0] network 192.168.2.0 0.0.0.255
[RouterB-ospf-1-area-0.0.0.0] network 10.0.2.0 0.0.0.255
```

3.5.3 Router C的配置

```
<RouterC> system-view
# 全局开启组播
[RouterC] multicast routing-enable
[RouterC] interface ethernet 0/0
[RouterC-Ethernet0/0] ip address 192.168.0.2 24
[RouterC-Ethernet0/0] pim sm
[RouterC-Ethernet0/0] quit
[RouterC] interface ethernet 0/1
[RouterC-Ethernet0/1] ip address 192.168.2.2 24
[RouterC-Ethernet0/1] pim sm
[RouterC-Ethernet0/1] quit
[RouterC] interface ethernet 0/2
[RouterC-Ethernet0/2] ip address 10.0.3.1 24
[RouterC-Ethernet0/2] igmp enable
[RouterC-Ethernet0/2] quit
# 创建一条 ACL 2005
[RouterC] acl number 2005
[RouterC-acl-basic-2005] rule 0 permit source 224.1.1.0 0.0.0.255
[RouterC-acl-basic-2005] quit
# 配置 C-BSR 和 C-RP
[RouterC] pim
[RouterC-pim] c-bsr ethernet 0/1
[RouterC-pim] c-rp ethernet 0/1 group-policy 2005
[RouterC-pim] quit
# 配置 OSPF
[RouterC] ospf 1
[RouterC-ospf-1] area 0.0.0.0
[RouterC-ospf-1-area-0.0.0.0] network 192.168.0.0 0.0.0.255
[RouterC-ospf-1-area-0.0.0.0] network 192.168.2.0 0.0.0.255
[RouterC-ospf-1-area-0.0.0.0] network 10.0.3.0 0.0.0.255
```

3.6 验证配置

(1) 使用 `display pim rp-info` 命令查看路由器上获取的 RP 信息

Router B 上的 RP 信息

```
<RouterB> display pim rp-info
VPN-Instance: public net
PIM-SM BSR RP information:
Group/MaskLen: 224.1.1.0/24
```

```
RP: 192.168.2.2
Priority: 192
HoldTime: 150
Uptime: 00:50:26
Expires: 00:02:19
```

Router C 上的 RP 信息

```
<RouterC> display pim rp-info
VPN-Instance: public net
PIM-SM BSR RP information:
Group/MaskLen: 224.1.1.0/24
RP: 192.168.2.2 (local)
Priority: 192
HoldTime: 150
Uptime: 00:51:42
Expires: 00:01:48
```

(2) 用 display pim routing-table 命令查看路由器的 PIM 路由表信息

```
<RouterB> display pim routing-table
VPN-Instance: public net
Total 1 (*, G) entry; 1 (S, G) entry

(*, 224.1.1.1)
RP: 192.168.2.2
Protocol: pim-sm, Flag: WC EXT
UpTime: 00:00:28
Upstream interface: Ethernet0/1
    Upstream neighbor: 192.168.2.2
    RPF prime neighbor: 192.168.2.2
Downstream interface(s) information: None

(10.0.1.2, 224.1.1.1)
RP: 192.168.2.2
Protocol: pim-sm, Flag: RPT SPT ACT
UpTime: 00:00:29
Upstream interface: Ethernet0/0
    Upstream neighbor: 192.168.1.1
    RPF prime neighbor: 192.168.1.1
Downstream interface(s) information: None
<RouterC> display pim routing-table
VPN-Instance: public net
Total 1 (*, G) entry; 1 (S, G) entry

(*, 224.1.1.1)
RP: 192.168.2.2 (local)
Protocol: pim-sm, Flag: WC
UpTime: 00:02:31
Upstream interface: Register
    Upstream neighbor: NULL
    RPF prime neighbor: NULL
```

```
Downstream interface(s) information:
Total number of downstreams: 1
  1: Ethernet0/1
      Protocol: pim-sm, UpTime: 00:02:31, Expires: 00:03:00
```

```
(10.0.1.2, 224.1.1.1)
RP: 192.168.2.2 (local)
Protocol: pim-sm, Flag: RPT SPT 2MSDP ACT
UpTime: 00:34:21
Upstream interface: Ethernet0/0
  Upstream neighbor: 192.168.0.1
  RPF prime neighbor: 192.168.0.1
Downstream interface(s) information: None
```

```
<RouterC> display pim rp-info
```

```
VPN-Instance: public net
PIM-SM BSR RP information:
Group/MaskLen: 224.1.1.0/24
  RP: 192.168.2.2 (local)
  Priority: 192
  HoldTime: 150
  Uptime: 00:51:42
  Expires: 00:01:48
```

(3) 使用 `display pim bsr-info` 命令查看路由器上 BSR 选举的信息

Router C 上的 BSR 选举信息

```
<RouterC> display pim bsr-info
```

```
VPN-Instance: public net
Elected BSR Address: 192.168.2.2
  Priority: 64
  Hash mask length: 30
  State: Elected
  Scope: Not scoped
  Uptime: 02:08:11
  Next BSR message scheduled at: 00:00:23
```

```
Candidate BSR Address: 192.168.2.2
```

```
  Priority: 64
  Hash mask length: 30
  State: Elected
  Scope: Not scoped
```

```
Candidate RP: 192.168.2.2(Ethernet0/1)
```

```
  Priority: 192
  HoldTime: 150
  Advertisement Interval: 60
  Next advertisement scheduled at: 00:00:58
```

Router B 上的 BSR 选举信息

```
<RouterB> display pim bsr-info
```

```
VPN-Instance: public net
```



```
Elected BSR Address: 192.168.2.2
  Priority: 64
  Hash mask length: 30
  State: Accept Preferred
  Scope: Not scoped
  Uptime: 01:40:49
  Expires: 00:01:39
```

3.7 配置文件

- Router A:

```
#
router id 10.0.1.0
#
multicast routing-enable
#
interface Ethernet0/0
port link-mode route
ip address 192.168.0.1 255.255.255.0
pim sm
#
interface Ethernet0/1
port link-mode route
ip address 192.168.1.1 255.255.255.0
pim sm
#
interface Ethernet0/2
port link-mode route
ip address 10.0.1.1 255.255.255.0
pim sm
#
ospf 1
area 0.0.0.0
network 192.168.1.0 0.0.0.255
network 192.168.0.0 0.0.0.255
network 10.0.1.0 0.0.0.255
```

- Router B :

```
#
router id 10.0.2.1
#
multicast routing-enable
#
interface Ethernet0/0
port link-mode route
ip address 192.168.1.2 255.255.255.0
pim sm
#
```

```

interface Ethernet0/1
  port link-mode route
  ip address 192.168.2.1 255.255.255.0
  pim sm
#
interface Ethernet0/2
  port link-mode route
  ip address 10.0.2.1 255.255.255.0
  igmp enable
#
ospf 1
  area 0.0.0.0
    network 192.168.1.0 0.0.0.255
    network 192.168.2.0 0.0.0.255
    network 10.0.2.0 0.0.0.255
#

```

- **Router C**

```

#
router id 10.0.3.1
#
multicast routing-enable
#
dar p2p signature-file cfa0:/p2p_default.mtd
#
port-security enable
#
undo ip http enable
#
multicast routing-enable
#
password-recovery enable
#
acl number 2005
  rule 0 permit source 224.1.1.0 0.0.0.255
#
interface Ethernet0/0
  port link-mode route
  ip address 192.168.0.2 255.255.255.0
  pim sm
#
interface Ethernet0/1
  port link-mode route
  ip address 192.168.2.2 255.255.255.0
  pim sm
#
interface Ethernet0/2
  port link-mode route
  ip address 10.0.3.1 255.255.255.0

```

```
igmp enable
#
ospf 1
area 0.0.0.0
network 192.168.0.0 0.0.0.255
network 192.168.2.0 0.0.0.255
network 10.0.3.0 0.0.0.255
#
pim
c-bsr Ethernet0/1
c-rp Ethernet0/1 group-policy 2005
#
```

4 相关资料

- H3C MSR 系列路由器 命令参考(V5)-R2311
- H3C MSR 系列路由器 配置指导(V5)-R2311