

ريسلل PIM و MSDP - ثبلا ددعت م هيچوتلا اهل الخ

تايوت حمل

[قمدق م](#)

[ايچولوبوط](#)

[مكحتلا يوتسم](#)

[\(3 يلا 1 نم تاوطخلا\) ردصم لايچست](#)

[\(4 - 11 تاوطخلا\) لبق تسمم تاالصتا قعومجم](#)

[12 ةوطخلا \(S,G\) R4 زارط مداخلل RP زارط PIM تاغطق](#)

[صخلم](#)

[قلص تاذا تامولعم](#)

قمدق م

فاشكتكا لوكوتوربو (PIM) لقتسمم ددعتم ثبلا لوكوتوربو ليغشت دن تسمم اذه فصية لملع مهفل ديفم اذهو. طيسب ددعتم ثب ططخم مادختسا (MSDP) ددعتم ثبلا ردصم لبق تسمم ادبي ام دنع يلا ردصم لايچست متي ام دنع نم ثادحالا لسلسل تومكحتلا يوتسم ددعتم ثبلا مزح يقلت ي.

Cisco نم 15.3M رادصلا ليغشت دن تسمم اذه ي قمدختسمم ازهجال موقت: **ةظحالم** IOS® قملعم ةئيب ي.

ايچولوبوط

يلا ةوطخلا هجومك R1 لمعي. ددعتم ثبلا ردصم يلع AS65000 ي تاذا ماطنلا يوتحي ناريج R3 و R7 و R3 (PIM RP) لابق تسمم اطقن عم (10.1.1.1) ردصم لايچسيسو (FHR) انوكيل R6 و R7 نيوكت مت. eBGP لوكوتوربل ناريج R7-R6 و R3-R4 و، iBGP لوكوتوربل لابق تسمم زاغ يلع R5 يوتحي، AS64999 ي. نيلقتسمم نيماطنلا نيبل لصفم لاسملا PIM RP لوكوتوربك R4 مادختسالا R5 نيوكت مت. ايلحم لصت م.

مكحتلا يوتسم

لوصلل ةارقلا لمعاو ويديفلا اذه ضرعا. يتمو لسرت ي تلا لئاسرلا يه ام ويديفلا رهظيو. ةوطخلا ل ي قملصفت فاصوا يلع.

(3 يلا 1 نم تاوطخلا) ردصم لايچست

، تانايبلا هذه يقلت دن ع. 239.1.1.1 يلا ددعتم ثبلا تانايب لاسرا ي قمدصم ادبي عاشن او ددعتم ثبلا ةمزح ذخاب (عطقم ل PIM ب صاخلا (DR) نيعمم هجوملا وه) R1 موقيس PIM لايچست لاسر.

PIM RP مالا R3 يلا R1 نم اهلاسر متي ي داخالا ثبلا PIM ةمزح يه لايچست لاسر

ردصم لآب

```
R1#
*May 21 14:54:08.461: PIM(0): Check RP 10.10.10.10 into the (*, 239.1.1.1) entry
*May 21 14:54:08.461: PIM(0): Building Triggered (*,G) Join / (S,G,RP-bit) Prune message
for 239.1.1.1
*May 21 14:54:08.461: PIM(0): Adding register encap tunnel (Tunnel0) as forwarding
interface of (10.1.1.1, 239.1.1.1).
```

اضيأ R3 لسري. ليجستللا فاقيا عم بيحتسي ولجسلا لاسر R3، PIM RP، يقلت ي، نألاو MSDP. نالعال حشرم هنا ينعي راسملا لىل ع "A" ملعلا. MSDP ربع R4 لىل MSDP SA لاسر رداصه جأوا لابقستسأ زاها ي أ دوجو مدعل ارطن اهبذشت مت هنا لىل "P" ةمالع ريشت ةومجملل.

```
R3#
*May 21 14:54:08.459: PIM(0): Received v2 Register on Ethernet1/0 from 10.0.12.1
*May 21 14:54:08.459:           for 10.1.1.1, group 239.1.1.1
*May 21 14:54:08.459: PIM(0): Check RP 10.10.10.10 into the (*, 239.1.1.1) entry
*May 21 14:54:08.459: PIM(0): Adding register decap tunnel (Tunnel1) as accepting
interface of (*, 239.1.1.1).
*May 21 14:54:08.459: PIM(0): Adding register decap tunnel (Tunnel1) as accepting
interface of (10.1.1.1, 239.1.1.1).
*May 21 14:54:08.459: PIM(0): Send v2 Register-Stop to 10.0.12.1 for 10.1.1.1,
group 239.1.1.1
```

```
R3#show ip mroute 239.1.1.1
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
       L - Local, P - Pruned, R - RP-bit set, F - Register flag,
       T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
       X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
       U - URD, I - Received Source Specific Host Report,
       Z - Multicast Tunnel, z - MDT-data group sender,
       Y - Joined MDT-data group, y - Sending to MDT-data group,
       G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
       Q - Received BGP S-A Route, q - Sent BGP S-A Route,
       V - RD & Vector, v - Vector
Outgoing interface flags: H - Hardware switched, A - Assert winner
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode
```

```
(* , 239.1.1.1), 00:00:33/stopped, RP 10.10.10.10, flags: SP
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list: Null
```

```
(10.1.1.1, 239.1.1.1), 00:00:33/00:02:26, flags: PA
Incoming interface: Ethernet1/0, RPF nbr 10.0.37.7
Outgoing interface list: Null
```

```
R3#show ip msdp sa-cache
MSDP Source-Active Cache - 0 entries
R3#
*May 21 14:54:58.511: MSDP(0): (10.1.1.1/32, 239.1.1.1)
```

R3 نم فقوللا R1 يقلت ي، انه

```
*May 21 14:54:08.461: PIM(0): Received v2 Register-Stop on Ethernet0/0 from 10.10.10.10
*May 21 14:54:08.461: PIM(0): for source 10.1.1.1, group 239.1.1.1
*May 21 14:54:08.461: PIM(0): Removing register encaps tunnel (Tunnel0) as forwarding
interface of (10.1.1.1, 239.1.1.1).
*May 21 14:54:08.461: PIM(0): Clear Registering flag to 10.10.10.10 for
(10.1.1.1/32, 239.1.1.1)
```

في R4، راسم ةلح دوجو مدع ةطحالم كنكمي، MSDP SA كيدل نكلو،

```
R4#show ip mroute
```

```
*May 21 14:54:58.591: MSDP(0): (10.1.1.1/32, 239.1.1.1), accepted
```

```
R4#show ip mroute
```

```
IP Multicast Routing Table
```

```
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector
```

```
Outgoing interface flags: H - Hardware switched, A - Assert winner
```

```
Timers: Uptime/Expires
```

```
Interface state: Interface, Next-Hop or VCD, State/Mode
```

```
(* , 224.0.1.40), 00:35:32/00:02:31, RP 10.20.20.20, flags: SJCL
```

```
Incoming interface: Null, RPF nbr 0.0.0.0
```

```
Outgoing interface list:
```

```
Ethernet1/0, Forward/Sparse, 00:23:16/00:02:36
```

```
Loopback0, Forward/Sparse, 00:35:31/00:02:31
```

```
R4#show ip msdp sa-cache
```

```
MSDP Source-Active Cache - 1 entries
```

```
(10.1.1.1, 239.1.1.1), RP 10.10.10.10, BGP/AS 65000, 00:01:00/00:05:49, Peer 10.33.33.33
```

(11 - 4 تا واطخالا) لبق تسمل االصتا ةعومجم

متي (*،G Join) PIM مامضنا ةمزح ينبيو هب ةصاخالا ةهجاو لا يلغ IGMP ةلصو R5 ملتسي
R6 لا مامضنالا لاسرا

```
R5#conf t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
R5(config)#int e0/1
```

```
R5(config-if)#ip igmp join-group 239.1.1.1
```

```
R5(config-if)#
```

```
*May 21 14:56:43.234: PIM(0): Check RP 10.20.20.20 into the (*, 239.1.1.1) entry
```

```
*May 21 14:56:43.234: PIM(0): Building Triggered (*,G) Join / (S,G,RP-bit) Prune message
for 239.1.1.1
```

```
*May 21 14:56:43.234: PIM(0): Building Triggered (*,G) Join / (S,G,RP-bit) Prune message
for 239.1.1.1
```

```
*May 21 14:56:43.234: PIM(0): Insert (*,239.1.1.1) join in nbr 10.0.56.6's queue
```

```
*May 21 14:56:43.246: PIM(0): Building Join/Prune packet for nbr 10.0.56.6
```

```
*May 21 14:56:43.246: PIM(0): Adding v2 (10.20.20.20/32, 239.1.1.1), WC-bit, RPT-bit,
S-bit Join
```

```
*May 21 14:56:43.246: PIM(0): Send v2 join/prune to 10.0.56.6 (Ethernet0/0)
```

R4 PIM RP إلى إلة صاو (*،G) لسري و، R5 ن م PIM إلة صاو (*،G) ر6 ى قلى تي

R6#

*May 21 14:56:43.248: PIM(0): Received v2 Join/Prune on Ethernet2/0 from 10.0.56.5, to us

May 21 14:56:43.248: PIM(0): Join-list: (, 239.1.1.1), RPT-bit set, WC-bit set, S-bit set

May 21 14:56:43.248: PIM(0): Check RP 10.20.20.20 into the (, 239.1.1.1) entry

May 21 14:56:43.248: PIM(0): Building Triggered (،G) Join / (S,G,RP-bit) Prune message for 239.1.1.1

May 21 14:56:43.248: PIM(0): Add Ethernet2/0/10.0.56.5 to (, 239.1.1.1), Forward state, by PIM *G Join

May 21 14:56:43.248: PIM(0): Building Triggered (،G) Join / (S,G,RP-bit) Prune message for 239.1.1.1

May 21 14:56:43.248: PIM(0): Insert (،239.1.1.1) join in nbr 10.0.46.4's queue

*May 21 14:56:43.248: PIM(0): Building Join/Prune packet for nbr 10.0.46.4

*May 21 14:56:43.248: PIM(0): Adding v2 (10.20.20.20/32, 239.1.1.1), WC-bit, RPT-bit, S-bit Join

*May 21 14:56:43.248: PIM(0): Send v2 join/prune to 10.0.46.4 (Ethernet1/0)

10.1.1.1، رءص م الى إ مامضنا (S،G) A لسري م ث. R6 ن مامضنالا (*،G) ر4 PIM RP ى قلى تي
R6 الى إ عري يذلا

R4#

*May 21 14:56:43.331: PIM(0): Received v2 Join/Prune on Ethernet1/0 from 10.0.46.6, to us

May 21 14:56:43.331: PIM(0): Join-list: (, 239.1.1.1), RPT-bit set, WC-bit set, S-bit set

May 21 14:56:43.331: PIM(0): Check RP 10.20.20.20 into the (, 239.1.1.1) entry

May 21 14:56:43.331: PIM(0): Adding register decap tunnel (Tunnel1) as accepting interface of (, 239.1.1.1).

May 21 14:56:43.331: PIM(0): Add Ethernet1/0/10.0.46.6 to (, 239.1.1.1), Forward state, by PIM *G Join

*May 21 14:56:43.331: PIM(0): Adding register decap tunnel (Tunnel1) as accepting interface of (10.1.1.1, 239.1.1.1).

*May 21 14:56:43.331: PIM(0): Insert (10.1.1.1,239.1.1.1) join in nbr 10.0.46.6's queue

R4#

*May 21 14:56:43.331: PIM(0): Building Join/Prune packet for nbr 10.0.46.6

*May 21 14:56:43.331: PIM(0): Adding v2 (10.1.1.1/32, 239.1.1.1), S-bit Join

*May 21 14:56:43.331: PIM(0): Send v2 join/prune to 10.0.46.6 (Ethernet1/0)

ي قلى دن ع. AS65000 ي ف R7 ون مامضنا (S،G) لسري م ث، R4 ن م (S،G) ط برلا R6 ى قلى تي
ك لذب م اى قلى م تي و. (9 ة و ط خ ل ل) R4 الى إ (SGR) ب ي ذ ش ت R6 لسري، R4 ن م (S،G) مامضنالا
R4 ي ف مزحلا راركت ب ن ج تل

*May 21 14:56:43.248: PIM(0): Received v2 Join/Prune on Ethernet1/0 from 10.0.46.4, to us

*May 21 14:56:43.248: PIM(0): Join-list: (10.1.1.1/32, 239.1.1.1), S-bit set

*May 21 14:56:43.248: PIM(0): Add Ethernet1/0/10.0.46.4 to (10.1.1.1, 239.1.1.1), Forward state, by PIM SG Join

*May 21 14:56:43.248: PIM(0): Insert (10.1.1.1,239.1.1.1) join in nbr 10.0.67.7's queue

R6#

*May 21 14:56:43.248: PIM(0): Building Join/Prune packet for nbr 10.0.67.7

*May 21 14:56:43.248: PIM(0): Adding v2 (10.1.1.1/32, 239.1.1.1), S-bit Join

*May 21 14:56:43.248: PIM(0): Send v2 join/prune to 10.0.67.7 (Ethernet0/0)

R6#

*May 21 14:56:44.476: PIM(0): Insert (10.1.1.1,239.1.1.1) sgr prune in nbr 10.0.46.4's queue

*May 21 14:56:44.476: PIM(0): Building Join/Prune packet for nbr 10.0.46.4

*May 21 14:56:44.476: PIM(0): Adding v2 (10.1.1.1/32, 239.1.1.1), RPT-bit, S-bit Prune

*May 21 14:56:44.476: PIM(0): Send v2 join/prune to 10.0.46.4 (Ethernet1/0)

ردصملا ىلى راسملا دعب R2 ىلى امامضنالا (S,G) لسري مٲ R6 نم (S,G) طبرلا R7 ىقلى

R7#

*May 21 14:56:43.241: PIM(0): Received v2 Join/Prune on Ethernet0/0 from 10.0.67.6, to us

*May 21 14:56:43.241: PIM(0): Join-list: (10.1.1.1/32, 239.1.1.1), S-bit set

May 21 14:56:43.241: PIM(0): Check RP 10.10.10.10 into the (, 239.1.1.1) entry

May 21 14:56:43.241: PIM(0): Building Triggered (,G) Join / (S,G,RP-bit) Prune message for 239.1.1.1

*May 21 14:56:43.241: PIM(0): Add Ethernet0/0/10.0.67.6 to (10.1.1.1, 239.1.1.1), Forward state, by PIM SG Join

*May 21 14:56:43.241: PIM(0): Insert (10.1.1.1,239.1.1.1) join in nbr 10.0.27.2's queue

*May 21 14:56:43.241: PIM(0): Building Join/Prune packet for nbr 10.0.27.2

R7#

*May 21 14:56:43.241: PIM(0): Adding v2 (10.1.1.1/32, 239.1.1.1), S-bit Join

*May 21 14:56:43.241: PIM(0): Send v2 join/prune to 10.0.27.2 (Ethernet2/0)

R7#show ip mroute

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,

L - Local, P - Pruned, R - RP-bit set, F - Register flag,

T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,

X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,

U - URD, I - Received Source Specific Host Report,

Z - Multicast Tunnel, z - MDT-data group sender,

Y - Joined MDT-data group, y - Sending to MDT-data group,

G - Received BGP C-Mroute, g - Sent BGP C-Mroute,

Q - Received BGP S-A Route, q - Sent BGP S-A Route,

V - RD & Vector, v - Vector

Outgoing interface flags: H - Hardware switched, A - Assert winner

Timers: Uptime/Expires

Interface state: Interface, Next-Hop or VCD, State/Mode

(*, 239.1.1.1), 00:03:33/stopped, RP 10.10.10.10, flags: SP

Incoming interface: Ethernet1/0, RPF nbr 10.0.37.3

Outgoing interface list: Null

(10.1.1.1, 239.1.1.1), 00:03:33/00:02:56, flags: T

Incoming interface: Ethernet2/0, RPF nbr 10.0.27.2

Outgoing interface list:

Ethernet0/0, Forward/Sparse, 00:03:33/00:02:53

ردصملا ىلى راسملا دعب R1 ىلى امامضنالا (S,G) لسري مٲ R7 نم (S,G) طبرلا R2 ىقلى

R2#

*May 21 14:56:43.253: PIM(0): Received v2 Join/Prune on Ethernet1/0 from 10.0.27.7, to us

*May 21 14:56:43.253: PIM(0): Join-list: (10.1.1.1/32, 239.1.1.1), S-bit set

May 21 14:56:43.253: PIM(0): Check RP 10.10.10.10 into the (, 239.1.1.1) entry

May 21 14:56:43.253: PIM(0): Building Triggered (,G) Join / (S,G,RP-bit) Prune message for 239.1.1.1

*May 21 14:56:43.253: PIM(0): Add Ethernet1/0/10.0.27.7 to (10.1.1.1, 239.1.1.1), Forward state, by PIM SG Join

*May 21 14:56:43.253: PIM(0): Insert (10.1.1.1,239.1.1.1) join in nbr 10.0.12.1's queue

*May 21 14:56:43.253: PIM(0): Building Join/Prune packet for nbr 10.0.12.1

R2#

*May 21 14:56:43.253: PIM(0): Adding v2 (10.1.1.1/32, 239.1.1.1), S-bit Join

*May 21 14:56:43.253: PIM(0): Send v2 join/prune to 10.0.12.1 (Ethernet0/0)

R2#show ip mroute

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector

Outgoing interface flags: H - Hardware switched, A - Assert winner

Timers: Uptime/Expires

Interface state: Interface, Next-Hop or VCD, State/Mode

(* , 239.1.1.1), 00:01:27/stopped, RP 10.10.10.10, flags: SP

Incoming interface: Ethernet1/0, RPF nbr 10.0.27.7

Outgoing interface list: Null

(10.1.1.1, 239.1.1.1), 00:01:27/00:01:32, flags: T

Incoming interface: Ethernet0/0, RPF nbr 10.0.12.1

Outgoing interface list:

Ethernet1/0, Forward/Sparse, 00:01:27/00:03:01

ةمءاق جراخ نراقلا لىل نراقلا فيضيو R2 نم دحوت (S,G) لىل R1 ىقلىتي

*May 21 14:56:43.261: PIM(0): Received v2 Join/Prune on Ethernet0/0 from 10.0.12.2, to us

*May 21 14:56:43.261: PIM(0): Join-list: (10.1.1.1/32, 239.1.1.1), S-bit set

*May 21 14:56:43.261: PIM(0): Add Ethernet0/0/10.0.12.2 to (10.1.1.1, 239.1.1.1),

Forward state, by PIM SG Join

R1#show ip mroute

IP Multicast Routing Table

Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector

Outgoing interface flags: H - Hardware switched, A - Assert winner

Timers: Uptime/Expires

Interface state: Interface, Next-Hop or VCD, State/Mode

(* , 239.1.1.1), 00:03:25/stopped, RP 10.10.10.10, flags: SPF

Incoming interface: Ethernet0/0, RPF nbr 10.0.12.2

Outgoing interface list: Null

(10.1.1.1, 239.1.1.1), 00:03:25/00:03:24, flags: FT

Incoming interface: Ethernet0/1, RPF nbr 0.0.0.0

Outgoing interface list:

Ethernet0/0, Forward/Sparse, 00:00:50/00:02:39

دنع .لبقتسم لىل قيرطال لوط لىل ع رصم لىل نم تانايب لىل قفدتت ،ةطقن لىل هذه دنع (S,G) ةرجش لىل (*,G) ةرجش نم R5 لىل وحتيس ،تانايب ةمزم مالتس لىل

R5#

*May 21 14:56:44.494: PIM(0): Insert (10.1.1.1,239.1.1.1) join in nbr 10.0.56.6's queue

```
*May 21 14:56:44.498: PIM(0): Building Join/Prune packet for nbr 10.0.56.6
*May 21 14:56:44.498: PIM(0): Adding v2 (10.1.1.1/32, 239.1.1.1), S-bit Join
*May 21 14:56:44.498: PIM(0): Send v2 join/prune to 10.0.56.6 (Ethernet0/0)
```

```
R5#show ip mroute
```

```
IP Multicast Routing Table
```

```
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
      L - Local, P - Pruned, R - RP-bit set, F - Register flag,
      T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
      X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
      U - URD, I - Received Source Specific Host Report,
      Z - Multicast Tunnel, z - MDT-data group sender,
      Y - Joined MDT-data group, y - Sending to MDT-data group,
      G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
      Q - Received BGP S-A Route, q - Sent BGP S-A Route,
      V - RD & Vector, v - Vector
```

```
Outgoing interface flags: H - Hardware switched, A - Assert winner
```

```
Timers: Uptime/Expires
```

```
Interface state: Interface, Next-Hop or VCD, State/Mode
```

```
(* , 239.1.1.1), 00:02:47/stopped, RP 10.20.20.20, flags: SJCL
```

```
Incoming interface: Ethernet0/0, RPF nbr 10.0.56.6
```

```
Outgoing interface list:
```

```
Ethernet0/1, Forward/Sparse, 00:02:47/00:02:14
```

```
(10.1.1.1, 239.1.1.1), 00:02:45/00:00:14, flags: LJT
```

```
Incoming interface: Ethernet0/0, RPF nbr 10.0.56.6
```

```
Outgoing interface list:
```

```
Ethernet0/1, Forward/Sparse, 00:02:45/00:02:14
```

R5 إلى E2/0 نم تاناي بل مزح لسريو R5: نم (S,G) طبرلا R6 ىقلى تي

```
R6#
```

```
*May 21 14:56:44.496: PIM(0): Received v2 Join/Prune on Ethernet2/0 from 10.0.56.5,
to us
```

```
*May 21 14:56:44.496: PIM(0): Join-list: (10.1.1.1/32, 239.1.1.1), S-bit set
```

```
*May 21 14:56:44.496: PIM(0): Update Ethernet2/0/10.0.56.5 to (10.1.1.1, 239.1.1.1),
Forward state, by PIM SG Join
```

```
*May 21 14:56:49.056: PIM(0): Received v2 Join/Prune on Ethernet1/0 from 10.0.46.4,
to us
```

```
*May 21 14:56:49.056: PIM(0): Prune-list: (10.1.1.1/32, 239.1.1.1)
```

```
*May 21 14:56:49.056: PIM(0): Prune Ethernet1/0/239.1.1.1 from (10.1.1.1/32, 239.1.1.1)
- deleted
```

```
R6#show ip mroute
```

```
IP Multicast Routing Table
```

```
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
      L - Local, P - Pruned, R - RP-bit set, F - Register flag,
      T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
      X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
      U - URD, I - Received Source Specific Host Report,
      Z - Multicast Tunnel, z - MDT-data group sender,
      Y - Joined MDT-data group, y - Sending to MDT-data group,
      G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
      Q - Received BGP S-A Route, q - Sent BGP S-A Route,
      V - RD & Vector, v - Vector
```

```
Outgoing interface flags: H - Hardware switched, A - Assert winner
```

```
Timers: Uptime/Expires
```

```
Interface state: Interface, Next-Hop or VCD, State/Mode
```

```
(* , 239.1.1.1), 00:03:43/00:02:42, RP 10.20.20.20, flags: S
```

```
Incoming interface: Ethernet1/0, RPF nbr 10.0.46.4
```

```
Outgoing interface list:
  Ethernet2/0, Forward/Sparse, 00:03:43/00:02:42
(10.1.1.1, 239.1.1.1), 00:03:43/00:02:46, flags: T
Incoming interface: Ethernet0/0, RPF nbr 10.0.67.7
Outgoing interface list:
  Ethernet2/0, Forward/Sparse, 00:03:43/00:02:44
```

12 ةوطخلا (S,G) R4 زارط مداخلل RP زارط PIM تاعطق

نأ طحال R6 زارط مداخلل ل (S,G) اب يذشت R4 زارط مداخلل RP لو كوتورب لسري، اريخأو (MSDP ءاشن مت يذلا لاخدا) راسملا ل ع ةدوجوم "M" ةمالعلا.

```
R4#
*May 21 14:56:44.559: PIM(0): Received v2 Join/Prune on Ethernet1/0 from 10.0.46.6,
to us
*May 21 14:56:44.559: PIM(0): Prune-list: (10.1.1.1/32, 239.1.1.1) RPT-bit set
*May 21 14:56:44.579: PIM(0): Removing register decap tunnel (Tunnel1) as accepting
interface of (10.1.1.1, 239.1.1.1).
*May 21 14:56:44.579: PIM(0): Installing Ethernet1/0 as accepting interface for
(10.1.1.1, 239.1.1.1).

*May 21 14:56:46.107: MSDP(0): (10.1.1.1/32, 239.1.1.1), accepted

*May 21 14:56:49.139: PIM(0): Insert (10.1.1.1,239.1.1.1) prune in nbr 10.0.46.6's queue
*May 21 14:56:49.139: PIM(0): Building Join/Prune packet for nbr 10.0.46.6
*May 21 14:56:49.139: PIM(0): Adding v2 (10.1.1.1/32, 239.1.1.1), S-bit Prune
*May 21 14:56:49.139: PIM(0): Send v2 join/prune to 10.0.46.6 (Ethernet1/0)
```

```
R4#show ip mroute
IP Multicast Routing Table
Flags: D - Dense, S - Sparse, B - Bidir Group, s - SSM Group, C - Connected,
L - Local, P - Pruned, R - RP-bit set, F - Register flag,
T - SPT-bit set, J - Join SPT, M - MSDP created entry, E - Extranet,
X - Proxy Join Timer Running, A - Candidate for MSDP Advertisement,
U - URD, I - Received Source Specific Host Report,
Z - Multicast Tunnel, z - MDT-data group sender,
Y - Joined MDT-data group, y - Sending to MDT-data group,
G - Received BGP C-Mroute, g - Sent BGP C-Mroute,
Q - Received BGP S-A Route, q - Sent BGP S-A Route,
V - RD & Vector, v - Vector
```

```
Outgoing interface flags: H - Hardware switched, A - Assert winner
Timers: Uptime/Expires
Interface state: Interface, Next-Hop or VCD, State/Mode
```

```
(* , 239.1.1.1), 00:02:15/00:03:12, RP 10.20.20.20, flags: S
Incoming interface: Null, RPF nbr 0.0.0.0
Outgoing interface list:
  Ethernet1/0, Forward/Sparse, 00:02:15/00:03:12
```

```
(10.1.1.1, 239.1.1.1), 00:02:15/00:02:46, flags: PMT
Incoming interface: Ethernet1/0, RPF nbr 10.0.46.6
Outgoing interface list: Null
```

R6. نم R4 ل (OIF) E1/0 ج راخ نراقلا تلزأ، انه

```
R6#
*May 21 14:56:49.056: PIM(0): Received v2 Join/Prune on Ethernet1/0 from 10.0.46.4, to us
*May 21 14:56:49.056: PIM(0): Prune-list: (10.1.1.1/32, 239.1.1.1)
*May 21 14:56:49.056: PIM(0): Prune Ethernet1/0/239.1.1.1 from (10.1.1.1/32, 239.1.1.1)
- deleted
```


صخلم

صاخلا RP اهنم لك مدختسي يتلا ةفلتخمل PIM تالاجم نيب طب رلل ةقيرط MSDP رفوي دننسملا اذه يف اهتيطغت متي مل يتلا "AnyCast RP" ذيفنن تل اهم ادختسا عيشي امك . اهب ردصم نم تانايبلا رورم ةكرح يقبلت ب دحاو لاجم يف يقبلت مل حامس لل اع م PIM و MSDP لمعي لاجم يف رداصملا لعل فرعتلا رخاا RP تالوكوتوربل MSDP SA لئاسرحتت . رخاا لاجم يف ددعتمل ثبلا ةرجش ءاشنل PIM مادختسا متي امنيب ، رخاا PIM

يف ةروكذمل RFC تامولعم لىل عجرا ، لوكوتوربل تاي لمع لوح لىصافتلا نم ديزمل ةلصلا تاذا تامولعمل

ةلص تاذا تامولعم

- PIM RFC

<https://tools.ietf.org/html/rfc4601>

- MSDP RFC

<https://tools.ietf.org/html/rfc3618>

ةمچرتل هذه ل و ح

ةلأل تاي نقتل ن م ة و مچ م ادخت ساب دن تسم ل ا اذ ه Cisco ت مچرت
م ل ا ل ا ا ن ا ع مچ ي ف ن ي م د خ ت س م ل ل م ع د ي و ت ح م م ي د ق ت ل ة ي ر ش ب ل و
ا م ك ة ق ي ق د ن و ك ت ن ل ة ل ا ة مچرت ل ض ف ا ن ا ة ظ ح ا ل م ي ج ر ي . ة ص ا خ ل ا م ه ت غ ل ب
Cisco ي ل خ ت . ف ر ت ح م مچرت م ا ه م د ق ي ي ت ل ا ة ي ف ا ر ت ح ا ل ا ة مچرت ل ا ع م ل ا ح ل ا و ه
ي ل ا م ا ة ا د ع و ج ر ل ا ب ي ص و ت و ت ا مچرت ل ا ه ذ ه ة ق د ن ع ا ه ت ي ل و ئ س م Cisco
Systems (ر ف و ت م ط ب ا ر ل ا) ي ل ص ا ل ا ي ز ي ل ج ن ا ل ا دن ت س م ل ا