



PIMv6 Anycast RP Solution

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Information About the PIMv6 Anycast RP Solution

PIMv6 Anycast RP Solution Overview

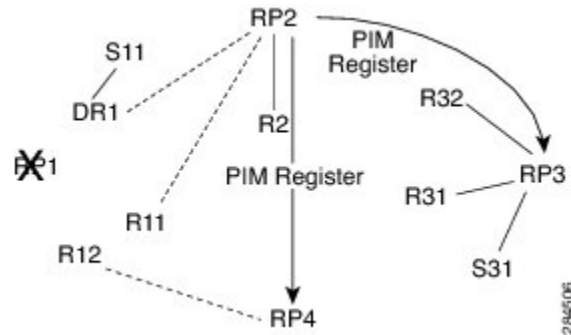
The anycast RP solution in IPv6 PIM allows an IPv6 network to support anycast services for the PIM-SM RP. It allows anycast RP to be used inside a domain that runs PIM only. Anycast RP can be used in IPv4 as well as IPv6, but it does not depend on the Multicast Source Discovery Protocol (MSDP), which runs only on IPv4. This feature is useful when interdomain connection is not required.

Anycast RP is a mechanism that ISP-based backbones use to get fast convergence when a PIM RP device fails. To allow receivers and sources to rendezvous to the closest RP, the packets from a source need to get to all RPs to find joined receivers.

The RP address, or a prefix that covers the RP address, is injected into the unicast routing system inside of the domain. Each device in the anycast RP set is configured with the addresses of all other devices in the anycast RP set, and this configuration must be consistent in all RPs in the set. The IP address of the local device must be included in the set so that all devices in anycast set have the same IP addresses.

PIMv6 Anycast RP Failover

The following illustration shows PIM anycast RP failover.



In failover, when RP1 is not reachable, the following occurs:

- Registers from DR1 will be routed transparently to RP2.
- R11 uses RP2 as the RP, and R12 uses RP4 as the RP.
- Registers from DR1 will be routed from RP2 to RP3 and RP4.

In this way, the loss of the RP (RP1 in this case) is transparent to DR1, R11, and R12, and the network can converge as soon as the IGP is converged.

How to Configure the PIMv6 Anycast RP Solution

Configuring PIMv6 Anycast RP

This task describes how to configure two PIMv6 anycast RP peers. Steps 3 through 11 show the configuration for RP1, and Steps 12 through 19 show the configuration for RP2.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ipv6 pim [vrf vrf-name] rp-address ipv6-address [group-address-list] [bidir]**
4. **interface type number**
5. **ipv6 address {ipv6-address/prefix-length | prefix-name sub-bits /prefix-length}**
6. **no shut**
7. **interface type number**
8. **ipv6 address {ipv6-address/prefix-length | prefix-name sub-bits /prefix-length}**
9. **no shut**
10. **exit**
11. **ipv6 pim anycast-RP rp-address peer-address**
12. **ipv6 pim [vrf vrf-name] rp-address ipv6-address [group-address-list] [bidir]**
13. **interface type number**
14. **ipv6 address {ipv6-address/prefix-length | prefix-name sub-bits /prefix-length}**
15. **no shut**
16. **interface type number**
17. **ipv6 address {ipv6-address/prefix-length | prefix-name sub-bits /prefix-length}**
18. **no shut**
19. **ipv6 pim anycast-RP rp-address peer-address**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	ipv6 pim [vrf vrf-name] rp-address ipv6-address [group-address-list] [bidir] Example: Device(config)# ipv6 pim rp-address 2001:DB8::1:1 acl_sparse1	Configures the address of a PIM RP for a particular group range.

	Command or Action	Purpose
Step 4	interface <i>type number</i> Example: Device(config)# interface Loopback4	Specifies an interface type and number, and places the device in interface configuration mode.
Step 5	ipv6 address { <i>ipv6-address/prefix-length</i> <i>prefix-name sub-bits /prefix-length</i> } Example: Device(config-if)# ipv6 address 2001:DB8::4:4/64	Configures an IPv6 address based on an IPv6 general prefix and enable IPv6 processing on an interface.
Step 6	no shut Example: Device(config-if)# no shut	Enables an interface.
Step 7	interface <i>type number</i> Example: Device(config-if)# interface Loopback5	Specifies an interface type and number, and places the device in interface configuration mode.
Step 8	ipv6 address { <i>ipv6-address/prefix-length</i> <i>prefix-name sub-bits /prefix-length</i> } Example: Device(config-if)# ipv6 address 2001:DB8:0:ABCD::1/64	Configures an IPv6 address based on an IPv6 general prefix and enable IPv6 processing on an interface.
Step 9	no shut Example: Device(config-if)# no shut	Enables an interface.
Step 10	exit Example: Device(config-if)# exit	Enter this command to exit interface configuration mode and enter global configuration mode.
Step 11	ipv6 pim anycast-RP <i>rp-address peer-address</i> Example: Device(config)# ipv6 pim anycast-rp 2001:DB8:0:ABCD::1 2001:DB8::3:3	Use this command to configure the address of the PIM RP for an anycast group range. <ul style="list-style-type: none"> The IP address of the local device must be included in the set so that all devices in anycast set have the same IP addresses.

	Command or Action	Purpose
Step 12	ipv6 pim [<i>vrf vrf-name</i>] rp-address <i>ipv6-address</i> [<i>group-address-list</i>] [<i>bidir</i>] Example: Device(config)# ipv6 pim rp-address 2001:DB8::1:1 acl_sparse1	Configures the address of a PIM RP for a particular group range.
Step 13	interface <i>type number</i> Example: Device(config)# interface Loopback4	Specifies an interface type and number, and places the device in interface configuration mode.
Step 14	ipv6 address { <i>ipv6-address/prefix-length</i> <i>prefix-name sub-bits /prefix-length</i> } Example: Device(config-if)# ipv6 address 2001:DB8::3:3/64	Configures an IPv6 address based on an IPv6 general prefix and enables IPv6 processing on an interface.
Step 15	no shut Example: Device(config-if)# no shut	Enables an interface.
Step 16	interface <i>type number</i> Example: Device(config-if)# interface Loopback5	Specifies an interface type and number, and places the device in interface configuration mode.
Step 17	ipv6 address { <i>ipv6-address/prefix-length</i> <i>prefix-name sub-bits /prefix-length</i> } Example: Device(config-if)# ipv6 address 2001:DB8:0:ABCD::1/64	Configures an IPv6 address based on an IPv6 general prefix and enables IPv6 processing on an interface.
Step 18	no shut Example: Device(config-if)# no shut	Enables an interface
Step 19	ipv6 pim anycast-RP <i>rp-address peer-address</i> Example: Device(config-if)# ipv6 pim anycast-rp 2001:DB8::1:1 2001:DB8::4:4	Use this command to configure the address of the PIM RP for an anycast group range.

Configuration Examples for the PIMv6 Anycast RP Solution

Example: Configuring PIMv6 Anycast RP

RP1

```
Device1(config)# ipv6 pim rp-address 2001:DB8::1:1 acl_sparse1
Device1(config)# interface Loopback4
Device1(config-if)# ipv6 address 2001:DB8::4:4/64
Device1(config-if)# no shut

Device1(config)# interface Loopback5
Device1(config-if)# ipv6 address 2001:DB8:0:ABCD::1/64
Device1(config-if)# no shut
Device1(config-if)# exit
Device1(config)# ipv6 pim anycast-rp 2001:DB8:0:ABCD::1 2001:DB8::3:3
```

RP2 (Anycast RP Peer)

```
Device2(config)# ipv6 pim rp-address 2001:DB8::1:1 acl_sparse1
Device2(config)# interface Loopback4
Device2(config-if)# ipv6 address 2001:DB8::3:3/64
Device2(config-if)# no shut

Device2(config)# interface Loopback5
Device2(config-if)# ipv6 address 2001:DB8:0:ABCD::1/64
Device2(config-if)# no shut
Device2(config)# ipv6 pim anycast-rp 2001:DB8::1:1 2001:DB8::4:4

Device2 show ipv6 pim anycast-rp 2001:DB8::1:1

Anycast RP Peers For 2001:DB8::1:1    Last Register/Register-Stop received
  2001:DB8::3:3 00:00:00/00:00:00
  2001:DB8::4:4 00:00:00/00:00:00
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
IPv6 commands	Cisco IOS IPv6 Command Reference
Cisco IOS IPv6 features	Cisco IOS IPv6 Feature Mapping

Standards and RFCs

Standard/RFC	Title
RFC 4610	<i>Anycast-RP Using Protocol Independent Multicast (PIM)</i>

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for PIMv6 Anycast RP Solution

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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Table 1: Feature Information for the PIMv6: Anycast RP Solution

Feature Name	Releases	Feature Information
PIMv6: Anycast RP Solution	15.1(3)S 15.2(3)T	<p>The anycast RP solution in IPv6 PIM allows an IPv6 network to support anycast services for the PIM-SM RP. It allows anycast RP to be used inside a domain that runs PIM only.</p> <p>The following commands were introduced or modified: ipv6 pim anycast-RP, show ipv6 pim anycast-RP.</p>