Configuring Multicast Extranet

This chapter describes how to configure the Multicast Extranet feature on Cisco Nexus 7000 Series Switches.

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Information About Configuring Multicast Extranet

An extranet can be viewed as part of a company's intranet that is extended to users outside the company. It has also been described as a "state of mind" in which a VPN is used as a way to do business with other companies as well as to sell products and content to customers and companies. An extranet is a VPN connecting the corporate site or sites to external business partners or suppliers to securely share part of a business's information or operations among them.

The Multicast VPN Extranet Support feature enables service providers to distribute IP multicast content originated from one enterprise site to other enterprise sites. This feature enables service providers to offer the next generation of flexible extranet services, helping to enable business partnerships between different enterprise VPN customers. Using this feature, service providers can offer multicast extranet contracts to meet various business partnership requirements, including short-term, annual, and rolling contracts.

Earlier to Release 8.2(1), Cisco NX-OS multicast implementation, multicast traffic can flow only within the same virtual routing and forwarding (VRF). However, with the introduction of the Multicast Extranet feature, multicast receivers can exist in different VRFs from source in an enterprise network.

With multicast extranet, the reverse path forwarding (RPF) lookup for multicast route in the receiver VRF can be carried out in the source VRF, thereby allowing to return a valid RPF interface. This forms a source or RP tree from the receiver VRF to the source VRF, thus enabling the traffic that originated from the source VRF to be forwarded to the outgoing interface (OIF) in the receiver VRF.

The Multicast VPN Extranet Support feature can be used to solve such business problems as:

- Efficient content distribution between enterprises
- Efficient content distribution from service providers or content providers to their different enterprise VPN customers

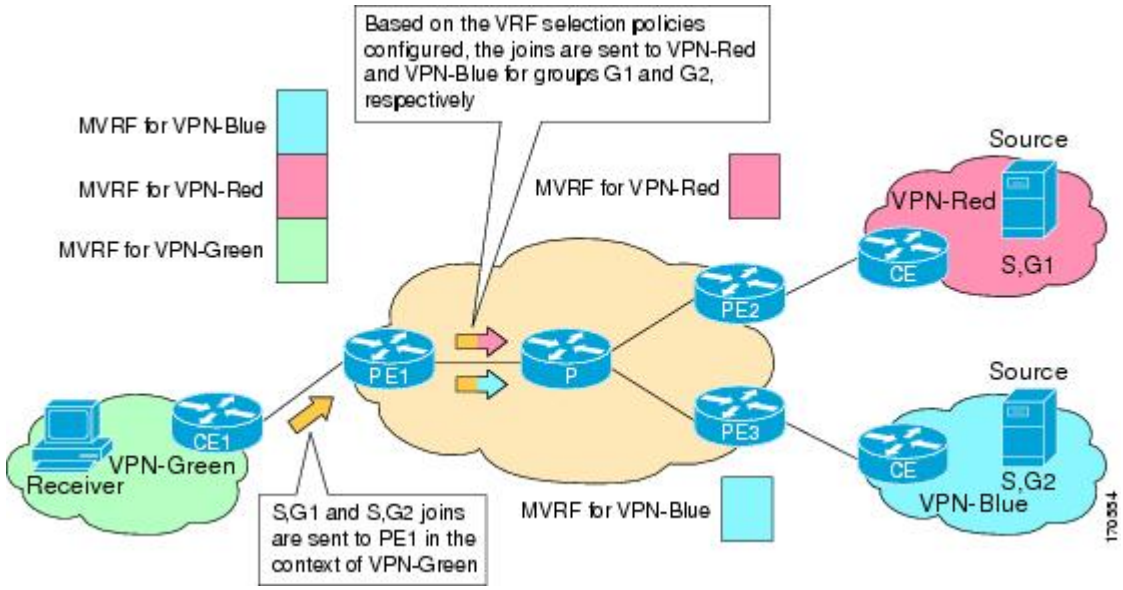
Prior to the introduction of the Multicast VPN Extranet VRF Select feature, RPF lookups for a source address could be performed only in a single VRF, that is, in the VRF where Internet Group Management Protocol (IGMP) or PIM joins are received, in the VRF learned from BGP imported routes, or in the VRF specified in static mroutes (when RPF for an extranet MVPN is configured using static mroutes). In those cases, the source VRF is solely determined by the source address or the way the source address was learned.

The Multicast Extranet VRF Select feature provides the capability for RPF lookups to be performed to the same source address in different VRFs using the group address as the VRF selector. This feature enhances extranet MVPNs by enabling service providers to distribute content streams coming in from different MVPNs and redistributing them from there.

The Multicast VPN VRF Select feature is configured by creating group-based VRF selection policies. Group-based VRF selection policies are configured using the ip multicast rpf select command. The ip multicast rpf select command is used to configure RPF lookups originating in a receiver MVRF or in the global routing table to be resolved in a source MVRF or in the global routing table based on group address. Access Control Lists (ACLs) are used to define the groups to be applied to group-based VRF selection policies.

The figure illustrates an extranet MVPN topology with the Multicast VPN VRF Select feature configured. In this topology, (S, G1) and (S, G2) PIM joins originating from VPN-Green, the receiver VRF, are forwarded to PE1, the receiver PE. Based on the group-based VRF selection policies configured, PE1 sends the PIM joins to VPN-Red and VPN-Blue for groups G1 and G2, respectively.

Figure 1: RPF Lookups Using Group-Based VRF Selection Policies



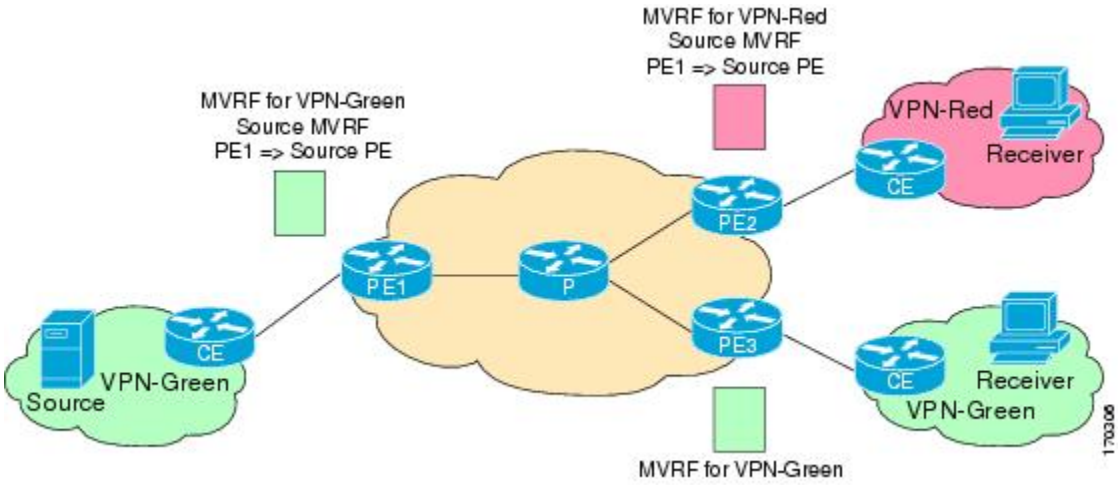
Components of Multicast Extranet

The figure below illustrates the components that constitute multicast extranet.

- **MVRF** --Multicast VPN routing and forwarding (VRF) instance. An MVRF is a multicast-enabled VRF. A VRF consists of an IP routing table, a derived forwarding table, a set of interfaces that use the forwarding table, and a set of rules and routing protocols that determine what goes into the forwarding table. In general, a VRF includes the routing information that defines a customer VPN site that is attached to a provider edge (PE) router.
- **Source MVRF** --An MVRF that can reach the source through a directly connected customer edge (CE) router.
- **Receiver MVRF** --An MVRF to which receivers are connected through one or more CE devices.
- **Source PE** --A PE router that has a multicast source behind a directly connected CE router.

- **Receiver PE** --A PE router that has one or more interested receivers behind a directly connected CE router.

Figure 2: Components of an Extranet MVPN



Guidelines and Limitations for Configuring Multicast Extranet

The Multicast Extranet feature has the following guidelines and limitations:

- RPF lookup will be performed on the VRF specified by the **ip multicast rpf select vrf** command. Fallback mode is not supported.
- The Multicast Extranet feature is supported only on M3 Series modules prior to Cisco NX-OS Release 8.4(1).
- Starting from Cisco NX-OS Release 8.4(1), the Multicast Extranet feature is supported on F4 Series modules.
- The number of multicast routes and VRFs that are required determine memory consumption by multicast.
- The source and (rendezvous point) RP should be in the same VRF.
- Static RP is supported for the multicast extranet group range.
- Multicast VPN (MVPN) extranet is not supported on multicast extranet.

How to Configure Multicast Extranet

Configuring Multicast Extranet

To configure multicast extranet, perform these steps.

Before you begin

Ensure that the Protocol Independent Multicast (PIM) sparse mode is enabled:

Procedure

Step 1 Enter configuration mode.

configure terminal

Step 2 Support RPF selection in a different VRF:

ip multicast rpf select vrf *src-vrf-name* **group-list** *group-range*

- **vrf** *src-vrf-name*—Specifies the source VRF name. The name can be a maximum of 32 alphanumeric characters, and is case sensitive.
- **group-list** *group-range*—Specifies the group range for the selected RPF. The format is A.B.C.D/LEN with a maximum length of 32.

To disable the support, use the **no** form of this command.

Step 3 View the running configuration information for the IPv4 multicast routes:

show ip mroute

Step 4 Save the configuration changes:

copy running-config startup-config

Configuration example for PVLAN over OTV

This example shows how to display information about running configuration for IPv4 multicast routes:

```
switch(config)# show ip mroute

IP Multicast Routing Table for VRF "default"

(*, 225.1.1.207/32), uptime: 00:13:33, ip pim
Incoming interface: Vlan147, RPF nbr: 147.147.147.2, uptime: 00:13:33
Outgoing interface list: (count: 0)

Extranet receiver in vrf blue:
(*, 225.1.1.207/32) OIF count: 1

(40.1.1.2/32, 225.1.1.207/32), uptime: 00:00:06, mrib ip pim
Incoming interface: Vlan147, RPF nbr: 147.147.147.2, uptime: 00:00:06
Outgoing interface list: (count: 0)

Extranet receiver in vrf blue:
(40.1.1.2/32, 225.1.1.207/32) OIF count: 1

switch(config)#
```

For detailed information about the fields in the output, see the *Cisco Nexus 7000 Series Command Reference*.

Additional References for Configuring Multicast Extranet

Related Documents

Related Topic	Document Title
CLI Commands	*Cisco Nexus 7000 Series Multicast Command Reference Guide*

Standards and RFCs

No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for Configuring Multicast Extranet

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.

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

Table 1: Feature Information for Configuring Multicast Extranet

Feature Name	Release	Feature Information
Multicast Extranet	8.4(1)	Added support for F4 Series modules.

Feature Name	Release	Feature Information
Configuring Multicast Extranet	8.2(1)	With multicast extranet, the reverse path forwarding (RPF) lookup for multicast route in the receiver VRF can be carried out in the source VRF, thereby allowing to return a valid RPF interface. The following command was introduced in this feature: **ip multicast rpf select vrf**.