

MT Tunnel Discovery and RPF check
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Abstract

This document describes a way to dynamically learn the headend point of a Multicast Tunnel (MT) and how to do a successful RPF check on the MT using a VPNv4 prefix reachable over that MT. This is complementary to [ROSEN- MCAST]

1. Status of this Memo

This document is an Internet-Draft and is in full conformance with all provisions of [Section 10 of RFC2026](#).

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3. Introduction

Multicast Tunnels are built between Provider Edge (PE) routers to allow multicast communication between different site's of a VPN. The MT tunnel has a destination MDT group address that is unique to the VPN. All routers that act as PE's and are configured for a

specific VPN join the VPN MDT multicast group in the backbone of the provider network to be able to receive each others packets. Each

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router is also a sender to the MDT group. How the forwarding of the MDT packets is achieved is depending on the PIM mode of the MDT group. This can be either PIM-Bidir, PIM-SM or PIM SSM. The proposal in this document is related specifically to PIM SSM mode.

An MT tunnel is setup between the PEs in one or more VPN-Providers networks. Over the MT tunnel we create PIM neighbor's. The IP address of the PIM neighbor that we see over the MT tunnel depends on the configured address of the Tunnel endpoint. This can either be an unnumbered address from a different interface or a configured address on the Tunnel itself. The PE router that does an RPF check on a VPN source can find which Tunnel the source is on, but may not know what PIM neighbor to target on that tunnel. Therefore we need a way to connect the BGP VPNv4 prefix to the PIM neighbor on the tunnel to allow the RPF check to succeed.

4. MT Tunnel discovery for SSM

PIM SSM does not have a mechanism to learn the source to a multicast group using PIM like in Sparse Mode. The signaling of the source is done via an out-of-band mechanism. To allow SSM mode for building the MT Tunnel we need an out-of-band mechanism to learn the source of the MT Tunnel so we can join directly to it using PIM SSM.

[BGP-MDT] defines a new AFI/SAFI to carry the MT Tunnel endpoint information. This AFI/SAFI carries the source of the MT tunnel, the MDT group and the RD for that specific VPN.

5. Originating PE's address for RPF

Suppose we want to join to a source that is behind another VPN site. We do an RPF lookup on the source address in the VPNv4 unicast table on this PE. The RPF lookup will return a connected next-hop and interface to use to reach the source. The returned next-hop may not be the neighbor on the MT tunnel. This can be due to the next-hop being rewritten by BGP Route Reflectors (RR) or crossing AS's. Therefore we don't know which PIM neighbor to target as upstream neighbor in the PIM join.

[BGP-MDT] defines a new attribute called the BGP Connector attribute. This document proposes sending the Originating PE's IP address as the value field when the BGP Connector attribute contains AFI/SAFI IPv4-MDT. This is the MT Tunnel IP address that is used to establish the PIM neighborship on the MT tunnel. This attribute is attached to all the BGP VPNv4 prefixes used for multicast. The PE router that was able to successfully RPF on a

BGP VPNv4 prefix will use the IP address learned from the connected attribute to find the PIM neighbor on the MT tunnel.

6. Intellectual Property Considerations

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8. Normative References

[ROSEN-MCAST] "Multicast in MPLS/BGP VPNs", Rosen, Cai, et. al. April 2003, <[draft-rosen-vpn-mcast-07.txt](#)>

[BIDIR] "Bi-directional Protocol Independent Multicast", Handley, Kouvelas, Speakman, Vicisano, June 2002, <[draft-ietf-pim-bidir-04.txt](#)>

[PIMv2] "Protocol Independent Multicast - Sparse Mode (PIM-SM)", Fenner, Handley, Holbrook, Kouvelas, December 2002, [draft-ietf-pim-sm-v2-new-06.txt](#)

[RFC2547bis] "BGP/MPLS VPNs", Rosen, et. al., November 2002, [draft-ietf-ppvpn-rfc2547bis-03.txt](#)

[BGP-MDT] "MDT SAFI", Nalawade, G., Sreekantiah, A., July 2004, <[draft-nalawade-idr-mdt-safi-01.txt](#)>, work in progress

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11. Expiration Date

This memo is filed as [<draft-nalawade-idr-mdt-safi-00.txt>](#), and expires January, 2005.

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