Provisioning, Auto-Discovery, and Signaling in L2VPNs for IPv6 Remote PE

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Abstract

L2VPN Signaling specification defines the semantic structure of the endpoint identifiers required by each model. It discusses the distribution of these identifiers by the discovery process, especially when discovery is based on the Border Gateway Protocol (BGP). This document updates the end point encoding for BGP-Based Auto-Discovery and suggests a format for NLRI encoding for IPv6 PE Address.

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Table of Contents

1 Introduction .................................................. 4
1.1 Terminology ................................................. 4
2 BGP NLRI format for the IPv6 PE Address .................... 4
3 Discussion on Route Distinguisher(RD) and Route Target(RT) .. 5
4 Security Considerations ...................................... 5
5 IANA Considerations .......................................... 5
6 References ...................................................... 6
   6.1 Normative References ..................................... 6
   6.2 Informative References .................................... 6
Authors’ Addresses ............................................... 6
Introduction

RFC 6074 specifies a number of L2VPN provisioning models, and further specifies the semantic structure of the endpoint identifiers required by each model. It discusses the distribution of these identifiers by the discovery process, especially when discovery is based on the Border Gateway Protocol (BGP). It then specifies how the endpoint identifiers are carried in the two signaling protocols that are used to set up PWs, the Label Distribution Protocol (LDP), and the Layer 2 Tunneling Protocol version 3 (L2TPv3). This draft updates the section 3.2.2.1 of RFC 6074 (BGP-Based Auto-Discovery) and suggests a format for NLRI encoding for IPv6 PE Address.

1.1 Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [RFC2119].

BGP NLRI format for the IPv6 PE Address

RFC 6074 Section 3.2.2.1 defines the BGP advertisement for a particular VSI at a given PE will contain:

- an NLRI of AFI = L2VPN, SAFI = VPLS, encoded as RD:PE_addr
- a BGP next hop equal to the loopback address of the PE
- an Extended Community Attribute containing the VPLS-id
- an Extended Community Attribute containing one or more RTs.

The format for the NLRI encoding defined in RFC 6074 Section 3.2.2.1 is:

```
+------------------------------------+
<table>
<thead>
<tr>
<th>Length (2 octets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route Distinguisher (8 octets)</td>
</tr>
<tr>
<td>------------------------------------</td>
</tr>
<tr>
<td>PE_addr (4 octets)</td>
</tr>
</tbody>
</table>
+------------------------------------|
```

In this format the size of the PE_addr is defined as 4 octets which can carry only IPv4 addresses. In a situation where the route is originating from a BGP end point running on an IPv6 address, the
PE_addr in the NLRI needs to carry that IPv6 address. The updated format for the NLRI encoding is:

+------------------------------------+
|  Length (2 octets)                 |
+------------------------------------+
|  Route Distinguisher (8 octets)    |
+------------------------------------+
|  PE_addr (4 or 16 octets)          |
+------------------------------------+

The length field MUST contain the sum of the length of the Length field(2), the length of the Route Distiguisher(8) and the length of the 4 or 16 octet PE_addr field.

The type of the PE_addr can be derived by the receiving node by subtracting the fixed length of the Route Distinguisher and the Length field from the value of the received Length.

This PE_addr should be used to initiate adjacency of the underlying signaling protocol if it supports IPv6 endpoints.(such as LDPv6)

3 Discussion on Route Distinguisher(RD) and Route Target(RT)

Note that RD and RT can be in format AS 2byte + 4 byte Assigned Number or IP 4 byte + 2 byte Assigned Number. Just like RD or RT cannot carry 4 byte AS numbers, they also cannot utilize 16 byte IPv6 Address. Updates to RD and RT to operate in a pure IPv6 environment is outside the scope of this document.

4 Security Considerations

There is no additional security impact in addition to what is mentioned in RFC6074.

5 IANA Considerations

No new IANA considerations are introduced in this specifications.
6 References

6.1 Normative References


6.2 Informative References


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