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IPv6 Extensions for Route Target Distribution
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Abstract

The current route target distribution specification as described in [RFC 4684] defines Route Target NLRIs of maximum length of 12 bytes. The IPv6 specific Route Target extended community is defined in [RFC 5701] as length of 20 bytes. Since the current specification only supports prefixes of maximum length of 12 bytes, the lack of an IPv6 specific Route Target reachability information may be a problem when an operator wants to use this application in a pure IPv6 environment. This document defines an extension that allows BGP to exchange longer length IPv6 Route Target prefixes.

Requirements Language

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].

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1. Introduction

The current constrained route distribution specification defined in [RFC4684] supports prefixes with a maximum length of 12 bytes. The prefix length needs to be extended to support the IPv6 specific Route Target extended community defined in [RFC5701] which is 20 bytes in length. This document defines an extension to the current constrained route distribution specification that allows BGP speakers to distribute longer length Route Target prefixes. A new BGP capability known as BGP IPv6 Constrained Route Target capability is defined as part of extension that allows an exchange of longer length Route Target prefixes. BGP speakers that do not exchange this capability MUST use Route Target NLRIs of maximum length of 12 bytes. In this way, the current extension would preserve the backward compatibility with [RFC4684].

2. BGP IPv6 Constrained Route Target Capability

The "BGP IPV6 Constrained Route Target Capability" is a new BGP capability [RFC5492]. The Capability code for this capability is specified in the IANA Considerations section of this document. The Capability length field of this capability is zero.

By advertising this capability to a peer, a BGP speaker conveys to the peer that the speaker support the longer length Route Target prefixes and the related procedures described in this document.

3. IPv6 Constrained Route Target NLRI Advertisements

Route Target membership NLRI is advertised in BGP UPDATE messages using the MP_REACH_NLRI and MP_UNREACH_NLRI attributes as defined in [RFC4760]. The NLRI field in the MP_REACH_NLRI and MP_UNREACH_NLRI is a prefix of 0 to 24 octets, encoded as defined in Section 4 of [RFC4760] for all the constrained route distribution.

This prefix is structured as follows:

```
+-------------------------------+
| origin as        (4 octets)   |
+-------------------------------+
| route target  (8 or 20 octets)|
~                               ~
|                               |
+-------------------------------+
```

Except for the default route target, which is encoded as a zero-length prefix, the minimum prefix length is 32 bits. As the origin-AS field cannot be interpreted as a prefix.

Route targets can then be expressed as prefixes, where, for instance, a prefix would encompass all route target extended communities assigned by a given Global Administrator [RFC4360] and [RFC5701]. Alternatively, route target prefixes could be aggregated however if done so, then only the Local Administrator field of the Route Target can be aggregated. Route Target Type and the Global Administrator Route Target fields MUST not be aggregated.

The default route target can be used to indicate to a peer the willingness to receive all VPN route advertisements such as, for instance, the case of a route reflector speaking to one of its PE router clients.

4. IANA Considerations

This document defined the IPV6 Constrained Route Target Capability for BGP. The Capability code needs to be assigned by the IANA.

5. Security Considerations

This extension to [RFC4684] does not change the underlying security issues inherent in the existing BGP and [RFC4684].

6. Acknowledgements

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7. References

7.1. Normative References

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7.2. Informative References

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