          L3VPN Address Prefix Based Outbound Route Filter for BGP-4
                     draft-xu-bess-l3vpn-prefix-orf-02

Abstract

   This document defines a new Outbound Router Filter (ORF) type for
   BGP, refered to as "L3VPN Address Prefix Outbound Route Filter", that
   can be used to perform L3VPN address-prefix-based route filtering.
   This ORF-type supports prefix-length- or range-based matching, wild-
   card-based address prefix matching, as well as the exact address
   prefix matching for L3VPN address families. The L3VPN Address Prefix
   ORF is applicable in the Virtual Subnet context.

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Table of Contents

1. Introduction

The Outbound Route Filtering (ORF) Capability defined in [RFC5291]
provides a mechanism for a BGP speaker to send to its BGP peer a set
of ORFs that can be used by its peer to filter its outbound routing
updates to the speaker. The Address Prefix ORF defined in [RFC5292]
is used to perform address-prefix-based route filtering. However,
the Address Prefix ORF is not much suitable for L3VPN [RFC4364] route
filtering since there is no Route-Target (RT) field contained in the
Address Prefix ORF entry.

This document builds on [RFC5292] and defines a new ORF-type for BGP,
referred to as "L3VPN Address Prefix Outbound Route Filter (L3VPN
Address Prefix ORF)", that can be used to perform L3VPN address
prefix-based route filtering. The L3VPN Address Prefix ORF supports
prefix-length- or range-based matching, wild-card-based address
prefix matching, as well as the exact address prefix matching for
L3VPN address families. The L3VPN Address Prefix ORF is applicable
to reduce the RIB size of PE routers in the Virtual Subnet
[I-D.ietf-l3vpn-virtual-subnet] context.

1.1. 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].

2. Terminology

This memo makes use of the terms defined in [RFC5292] and [RFC4364].

3. L3VPN Address Prefix ORF Encoding

The ORF-Type for the L3VPN Address Prefix ORF-Type is TBD.

A L3VPN Address Prefix ORF entry includes a Route Target field in
addition to those fields which have been contained in the Address
Prefix ORF [RFC5292]. That's to say, a L3VPN Address Prefix ORF
entry consists of the following fields <Sequence, Action, Match,
Reserved, Route-Target, Minlen, Maxlen, Length, Prefix>. Note that
the Prefix field here doesn't include the Route Distinguisher (RD)
part of a L3VPN address prefix. For example, in the case of a VPNv4
address prefix, only the IPv4 address prefix part of that VPNv4
address prefix is contained in that Prefix field.

A L3VPN Address Prefix ORF entry is encoded as follows: the "Action",
"Match" and "Reserved" fields of the entry are encoded in the common
part [RFC5291], while the remaining fields of the entry are encoded
in the "type specific part" [RFC5291], as shown in Figure 1. When
the Action component of an ORF entry specifies REMOVE-ALL, the entry
consists of only the common part.

```
+-------------------------------+
|   Sequence (4 octets)         |
+-------------------------------+
|   Route Target(8 or 16 octets)|
+-------------------------------+
|   Minlen   (1 octet)          |
+-------------------------------+
|   Maxlen   (1 octet)          |
+-------------------------------+
|   Length   (1 octet)          |
+-------------------------------+
|   Prefix   (variable length)  |
+-------------------------------+
```

Figure 1: Type Specific Part of L3VPN Address Prefix ORF Entry
Encoding

4. L3VPN Address Prefix ORF Matching

When performing route matching search on those L3VPN routes which are
associated with the Route Target as specified in the received L3VPN
Address Prefix ORF entries, the Address-Prefix-ORF-specific matching

rules as defined in [RFC5292] are almost preserved except that the RD
SHOULD be ignored.

5. Acknowledgements

The authors would like to thank Mach Chen and Shunwan Zhuang for
their comments on this document.

6. IANA Considerations

The ORF-type for the L3VPN Address Prefix ORF needs to be assigned by
the IANA.

7. Security Considerations

This document does not introduce any new security considerations.

8. References

8.1. Normative References

[RFC2119]   Bradner, S., "Key words for use in RFCs to Indicate
            Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC5291]   Chen, E. and Y. Rekhter, "Outbound Route Filtering
            Capability for BGP-4", RFC 5291, August 2008.

[RFC5292]   Chen, E. and S. Sangli, "Address-Prefix-Based Outbound
            Route Filter for BGP-4", RFC 5292, August 2008.

8.2. Informative References

[I-D.ietf-l3vpn-virtual-subnet]
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[RFC4364]   Rosen, E. and Y. Rekhter, "BGP/MPLS IP Virtual Private
            Networks (VPNs)", RFC 4364, February 2006.

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