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X. Xu  
Huawei  
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L3VPN Address Prefix Based Outbound Route Filter for BGP-4  
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## Abstract

This document defines a new Outbound Router Filter (ORF) type for BGP, referred 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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## [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](#)].

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## [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 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

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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]

Xu, X., Raszuk, R., Hares, S., Yongbing, F., Jacquenet, C., Boyes, T., and B. Fee, "Virtual Subnet: A L3VPN-based Subnet Extension Solution", [draft-ietf-l3vpn-virtual-subnet-03](#) (work in progress), December 2014.

[RFC4364] Rosen, E. and Y. Rekhter, "BGP/MPLS IP Virtual Private Networks (VPNs)", [RFC 4364](#), February 2006.

### Author's Address

Xiaohu Xu  
Huawei

Email: [xuxiaohu@huawei.com](mailto:xuxiaohu@huawei.com)