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BGP Extended Community for Identifying the Target Node
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Abstract

BGP has been used to distribute different types of routing and policy information in the network. In some cases, the information distributed may be only intended for one or several particular receiving BGP nodes in the network. BGP does not have a general mechanism for designating the receiving node of the routing information. This document defines a new type of BGP extended community called "Node Target". The mechanism and of using the Node Target extended community to steer BGP route distribution to particular BGP nodes is specified.

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

BGP [[RFC4271](#)] has been used to distribute different types of routing and policy information in the network. In some cases, the information distributed may be only intended for one or several particular receiving BGP nodes in the network. A typical use case is the distribution of BGP FlowSpec [[RFC5575](#)] policies to some particular BGP nodes.

BGP does not have a general mechanism for designating the receiving nodes of the information to be distributed. Route Target (RT) as defined in [[RFC4364](#)] is used for the distribution of VPN routes into the target VPN Routing and Forwarding tables (VRFs) on a set of PE nodes. Although it is possible to use RTs to control the distribution of non VPN-specific information to a particular node, such mechanism is not applicable when the information to be distributed is VPN-specific and relies on RTs to match the target VRF. Thus a new mechanism is needed to control the distribution of

BGP information to particular BGP nodes, which is independent from the control of VPN route distribution to VRF.

2. Node Target Extended Communities

2.1. IPv4 Node Target Extended Community

For IPv4 networks, this section defines a new BGP extended community [RFC4360] called "IPv4 Node Target Extended Community". It is a transitive extended community with type 0x01 and sub-type TBA.

The format of IPv4 Node Target Extended Community is shown in Figure 1.

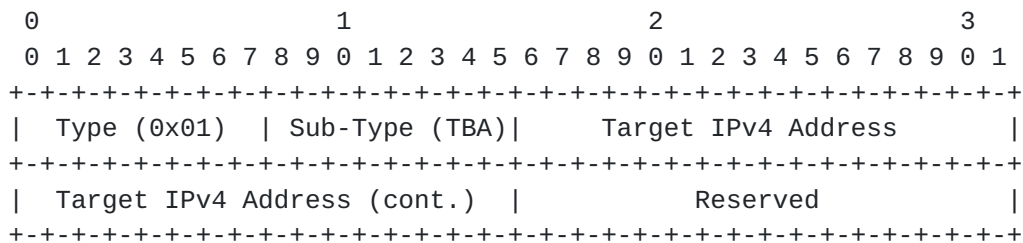


Figure 1. IPv4 Node Target extended community

Target IPv4 address field: A local IPv4 address of the target node. When the target IPv4 address is set to 0.0.0.0, it means all the BGP nodes in the network are the target nodes.

Reserved field: Reserved for future use, MUST be set to zero on transmission and ignored on receipt.

One or more IPv4 Node Target extended communities may be carried in a BGP Update message.

2.2. IPv6 Node Target Extended Community

For IPv6 networks, a new IPv6 Address Specific BGP Extended Community [RFC5701] called "IPv6 Node Target extended community" is defined. It is a transitive IPv6 address specific extended community with type 0x00 and sub-type TBA.

The format of this extended community is shown in Figure 2.

- 0 If the target IPv4 or IPv6 address in any of the IPv4 or IPv6 Node
Target extended community matches with one of the local IP
addresses, the receiving BGP speaker is one of the target nodes of
the information in the Update, and the information in the Update
is eligible to be kept and installed by the receiving BGP speaker.

- o If the target IPv4 or IPv6 address in any of the IPv4 or IPv6 Node Target extended community does not match with any local IP address, the receiving BGP speaker is not the target node of information in the Update, the information in the received Update message MUST not be used.

If a route-reflector (RR) receives an BGP Update message which contains one or more IPv4 or IPv6 Node Target extended communities, it MUST check the target IPv4 or IPv6 addresses carried in the IPv4 or IPv6 Node Target extended communities.

- o If the target IPv4 or IPv6 address in any of the IPv4 or IPv6 Node Target extended community matches with one of the local IP addresses, this RR is one of the target nodes of information in the Update, and such information is eligible to be kept and installed by this RR. If there is no other IPv4 or IPv6 Node Target extended communities in the Update, the RR MUST NOT advertise the information in this Update further to its neighbors. If there is other IPv4 or IPv6 Node Target extended communities, the RR SHOULD first remove the local matched Node Target extended community, then reflect the routes with the remaining Node Target Extended Communities according to [[RFC4456](#)].
- o If the target IPv4 or IPv6 address in any of the IPv4 or IPv6 Node target extended community does not match with any local IP address, this RR is not the target node of routes in the Update, the rules defined in [[RFC4456](#)] are used for the reflection of the received route.

4. IANA Considerations

This document requests that IANA assigns one new sub-type for "IPv4 Node Target extended community" from the "Transitive IPv4-Address-Specific Extended Community" registry of the "BGP extended communities" registry.

This document requests that IANA assigns one new type for "IPv6 Node Target extended community" from the "Transitive IPv6-Address-Specific Extended Community" registry of the "BGP extended communities" registry.

5. Security Considerations

This document does not change the security properties of BGP.

6. Acknowledgements

The authors would like to thank Zhenbin Li for the discussion and review of this document.

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