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                  Route Refresh Capability for BGP-4

Abstract

   This document defines a new Border Gateway Protocol (BGP) capability
   termed 'Route Refresh Capability', which would allow the dynamic
   exchange of route refresh request between BGP speakers and subsequent
   re-advertisement of the respective Adj-RIB-Out. One possible
   application of this capability is to facilitate non-disruptive
   routing policy changes.

1. Introduction

   Currently there does not exist a mechanism in BGP-4 [BGP-4] to
   dynamically request a re-advertisement of the Adj-RIB-Out from a BGP
   peer. When the inbound routing policy for a peer changes, all
   prefixes from that peer must be somehow made available and then re-
   examined against the new policy. To accomplish this, a commonly used
   approach, known as 'soft-reconfiguration', is to store an unmodified
   copy of all routes from that peer at all times, even though routing
   policies do not change frequently (typically no more than a couple
   times a day). Additional memory and CPU are required to maintain
   these routes.

   This document proposes an alternative solution that avoids the
   additional maintenance cost. More specifically, it defines a new BGP
   capability termed 'Route Refresh Capability', which would allow the
   dynamic exchange of route refresh request between BGP speakers and
   subsequent re-advertisement of the respective Adj-RIB-Out.

2. Route Refresh Capability

   To advertise the Route Refresh Capability to a peer, a BGP speaker
   uses BGP Capabilities Advertisement [BGP-CAP]. This capability is
   advertised using the Capability code 2 and Capability length 0.

   By advertising the Route Refresh Capability to a peer, a BGP speaker
   conveys to the peer that the speaker is capable of receiving and
   properly handling the ROUTE-REFRESH message (as defined in Section 3)
   from the peer.

3. Route-REFRESH Message

   The ROUTE-REFRESH message is a new BGP message type defined as
   follows:

        Type: 5 - ROUTE-REFRESH

        Message Format: One <AFI, SAFI> encoded as

```
              0       7      15      23      31
              +-------+-------+-------+-------+
              |      AFI      | Res.  | SAFI  |
              +-------+-------+-------+-------+
```

        The meaning, use and encoding of this <AFI, SAFI> field is the
        same as defined in [BGP-MP, sect. 7]. More specifically,

           AFI - Address Family Identifier (16 bit).

           Res. - Reserved (8 bit) field. Should be set to 0 by the
                  sender and ignored by the receiver.

           SAFI - Subsequent Address Family Identifier (8 bit).

4. Operation

   A BGP speaker that is willing to receive the ROUTE-REFRESH message
   from its peer should advertise the Route Refresh Capability to the
   peer using BGP Capabilities advertisement [BGP-CAP].

   A BGP speaker may send a ROUTE-REFRESH message to its peer only if it
   has received the Route Refresh Capability from its peer. The <AFI,
   SAFI> carried in such a message should be one of the <AFI, SAFI> that
   the peer has advertised to the speaker at the session establishment
   time via capability advertisement.

If a BGP speaker receives from its peer a ROUTE-REFRESH message with
the <AFI, SAFI> that the speaker didn't advertise to the peer at the
session establishment time via capability advertisement, the speaker
shall ignore such a message. Otherwise, the BGP speaker shall re-
advertise to that peer the Adj-RIB-Out of the <AFI, SAFI> carried in
the message, based on its outbound route filtering policy.

5. Security Considerations

    This extension to BGP does not change the underlying security issues.

6. Acknowledgments

    The concept of Route Refresh proposed is similar to the one used in
    IDRP.

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    Ramachandra and Bruce Cole for their review and comments.

7. References

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9. Full Copyright Statement

Acknowledgement