Update Attribute Flag Low Bits Clarification
draft-hares-idr-update-attrib-low-bits-fix-01

Abstract

   This draft provides an update to RFC 4721 to clarify the use of the
   lower-order four bits of the Attribute flag in the Update message.

Status of this Memo

Copyright Notice

Table of Contents

1. Introduction

   [RFC4271] specifies in section 4.3 that that the low order four bits
   of the the Attribute Flags octet are unused, and MUST be zero when
   sent. There is a disagreement on what when sent means. This draft
   specifies the meaning.

   The issue has been that one school of thought considers that "when
   sent" means when originated. Another holds that "when sent" means
   when originated or propagated. This draft takes the second approach
   of "when sent" being when originated or propagated.

   The real issue is that reserved flags are only useful if there is
   some hope of someday using them for something. If implementations
   reset these flags on propagation, then a future revision to the BGP
   specification which introduces a new flag will not be able to
   propagate the new attribute flag end to end, since it would be very
   likely that some well-meaning intermediate router would zero on it.
   The effort to roll out implementations that transited the new flag
   would almost certainly be prohibitive.

2. Change to RFC 4271 Section 4.3

```
               0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
               +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
               |  Attr. Flags  |Attr. Type Code|
               +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

      Original Text:

      The lower-order four bits of the Attribute Flags octet are
      unused. They MUST be zero when sent and MUST be ignored when
      received

      Corrected Text:

      The lower-order four bits of the Attribute Flags octet are
      unused. They MUST be zero when originated or sent.
      When received, any MUST be accepted and ignored.

3. Known BGP Implementation Habits

The following are BGP implementation habits regarding the unused flag
bits

o always ignore bits received, and always send zero (originated or
   propagated);

o always ignore bits received, always send zero bits (originated),
   and propagate what was received;

o if non-zero bits are received, drop the peering session;

o by special condition (policy) handle set bits or set bits, and
   propagate;and

o always sets bits under special conditions, and propagates bits.

The reset of BGP sessions based on non-zero bits has been documented
at:

http://mailman.nanog.org/pipermail/nanog/2012-November/053754.html

Compliance with this draft, as well as [RFC4271], means that routers
should not reset BGP sessions if if non-zero lower bits are received.

4. IANA Considerations

This document includes no request to IANA.

5. Security Considerations

This document has no new security cases.

It clarifies some BGP UPDATE packet flag values and thus may aid in
improving BGP security. In particular, it makes it even clearer that
routers must not reset a session upon receiving unexpected flag
values. Behaving otherwise exposes a router to a denial-of-service
attack since a distant party might be able to inject such flag
values.

6. Normative References

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

   [RFC4271]   Rekhter, Y., Li, T., and S. Hares, "A Border Gateway
               Protocol 4 (BGP-4)", RFC 4271, January 2006.

Authors' Addresses

   Susan Hares
   Huawei Technologies (USA)
   2330 Central Expressway
   Santa Clara, CA 95050
   USA

   Email: Susan.Hares@huawei.com

   John Scudder
   Juniper Networks
   1194 N. Mathilda Ave
   Sunnyvale, CA 94089
   USA

   Email: jgs@juniper.net