Global Routing Operations   P. Lucente
Internet-Draft   NTT
Updates: 7854 (if approved)   Y. Gu
Intended status: Standards Track   Huawei
Expires: 21 July 2022   17 January 2022

      Support for Enterprise-specific TLVs in the BGP Monitoring Protocol
                     draft-lucente-grow-bmp-tlv-ebit-02

Abstract

   Message types defined by the BGP Monitoring Protocol (BMP) do
   provision for data in TLV - Type, Length, Value - format, either in
   the shape of optional TLVs at the end of a BMP message or Stats
   Reports TLVs. However the space for Type value is unique and
   governed by IANA. To allow the usage of vendor-specific TLVs, a
   mechanism to define per-vendor Type values is required. In this
   document we introduce an Enterprise Bit, or E-bit, for such purpose.

Status of This Memo

   This Internet-Draft is submitted in full conformance with the
   provisions of BCP 78 and BCP 79.

   Internet-Drafts are working documents of the Internet Engineering
   Task Force (IETF). Note that other groups may also distribute
   working documents as Internet-Drafts. The list of current Internet-
   Drafts is at https://datatracker.ietf.org/drafts/current/.

   Internet-Drafts are draft documents valid for a maximum of six months
   and may be updated, replaced, or obsoleted by other documents at any
   time. It is inappropriate to use Internet-Drafts as reference
   material or to cite them other than as "work in progress."

   This Internet-Draft will expire on 21 July 2022.

Copyright Notice

Table of Contents

1. Introduction

   The BGP Monitoring Protocol (BMP) is defined in RFC 7854 [RFC7854].
   Support for trailing TLV data is extended by TLV support for BMP
   Route Monitoring and Peer Down Messages [I-D.ietf-grow-bmp-tlv].

   Vendors need the ability to define proprietary Information Elements,
   because, for example, they are delivering a pre-standard product.
   This This would align with Also for code point assignment to be
   eligible, an IETF document needs to be adopted at a Working Group and
   in a stable condition. In this context E-bit helps during early
   development phases where inter-operability among vendors is tested
   and shipped to network operators to be tested there as well. This
   would align with This document re-defines the format of IANA-
   registered TLVs in a backward compatible manner with respect to
   previous documents and existing IANA allocations; it also defines the
   format for newly introduced enterprise-specific TLVs. The concept of
   an E-bit, or Enterprise Bit, is not new. For example, such mechanism
   is defined in Section 4.1 of [RFC8126]. Section 4.2 of [RFC8126].
   Section 3.2 of [RFC7011] for a very similar purpose.

2. Terminology

   The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
   "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and
   "OPTIONAL" in this document are to be interpreted as described in BCP
   14 RFC 2119 [RFC2119] RFC 8174 [RFC8174] when, and only when, they
   appear in all capitals, as shown here.

3. TLV encoding

3.1. IANA-registered TLV encoding

   Existing TLV encodings are defined in Section 4.4 of [RFC7854]
   (Information TLVs), Section 4.8 of [RFC7854] (Stats Reports TLVs),
   draft-ietf-grow-bmp-tlv [I-D.ietf-grow-bmp-tlv] and
   draft-ietf-grow-bmp-peer-up [I-D.ietf-grow-bmp-peer-up] and are
   updated as follows:

   * 1 bit to flag an enterprise-specific TLV set to zero. The TLV
      Type value must have been defined in IANA-BMP [IANA-BMP]

   * 15 bits of TLV Type,

   * 2 octets of TLV Value length,

   * 0 or more octets of TLV Value.

```
    0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
   +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
   |E|           Type              |       Length (2 octets)       |
   +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
   |                        Value (variable)                      |
   +-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

                                Figure 1
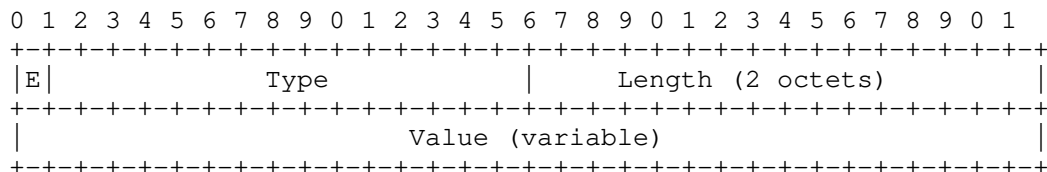
   TLVs SHOULD be sorted by their code point.

3.2. Enterprise-specific TLV encoding

   Enterprise-specific TLV encoding is defined as follows:

   * 1 bit to flag an enterprise-specific TLV set to one

   * 15 bits of TLV Type,

   * 2 octets of IANA PEN plus TLV value length,

   * 4 octets of IANA Private Enterprise Number IANA-PEN [IANA-PEN]
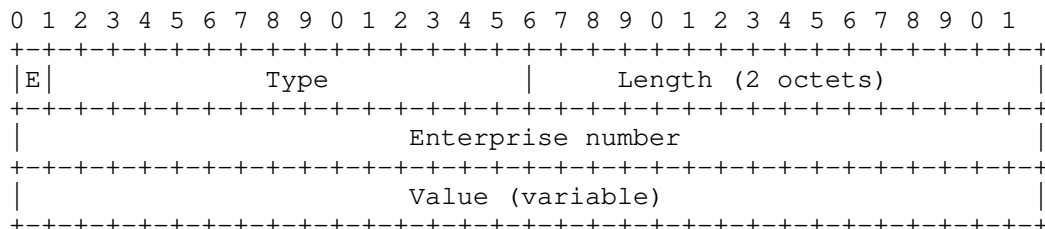
   * 0 or more octets of TLV Value.

```
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|E|            Type             |        Length (2 octets)      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                        Enterprise number                      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                        Value (variable)                       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

                               Figure 2

3.3. TLV encoding remarks

   The encoding specified in this document applies to all existing BMP
   Message Types and their namespaces defined in Future BMP Message
   Types MUST make use of the TLV encoding defined in this document.
   Multiple TLVs of the same type can be repeated as part of the same
   message and it is left to the specific use-cases whether all, any,
   the first or the last TLV should be considered. RFC 7854 [RFC7854],
   TLV support for BMP Route Monitoring and Peer Down Messages
   [I-D.ietf-grow-bmp-tlv] and BMP Peer Up Message Namespace
   [I-D.ietf-grow-bmp-peer-up]. While the proposed encoding is not per-
   se backward compatible, there is no existing IANA-allocated Type
   value that makes use of the most significant bit (which is being used
   in this document to define the E-bit).

4. Security Considerations

   This document does not add any additional security considerations.

5. Operational Considerations

   It is recommended that vendors making use of the Enterprise Bit
   extension have a well-defined internal registry for privately
   assigned code points that is also exposed to the public.

6. IANA Considerations

   The TLV Type values used by BMP are managed by IANA as are the
   Private Enterprise Numbers used by enterprise-specific Type values
   IANA-PEN [IANA-PEN]. This document makes no changes to these
   registries.

7. References

7.1. Normative References

   [I-D.ietf-grow-bmp-peer-up]
              Scudder, J., "BMP Peer Up Message Namespace", Work in
              Progress, Internet-Draft, draft-ietf-grow-bmp-peer-up-00,
              24 July 2019, <https://www.ietf.org/archive/id/draft-ietf-
              grow-bmp-peer-up-00.txt>.

   [I-D.ietf-grow-bmp-tlv]
              Lucente, P. and Y. Gu, "TLV support for BMP Route
              Monitoring and Peer Down Messages", Work in Progress,
              Internet-Draft, draft-ietf-grow-bmp-tlv-06, 25 October
              2021, <https://www.ietf.org/archive/id/draft-ietf-grow-
              bmp-tlv-06.txt>.

   [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
              Requirement Levels", BCP 14, RFC 2119,
              DOI 10.17487/RFC2119, March 1997,
              <https://www.rfc-editor.org/info/rfc2119>.

   [RFC7854] Scudder, J., Ed., Fernando, R., and S. Stuart, "BGP
              Monitoring Protocol (BMP)", RFC 7854,
              DOI 10.17487/RFC7854, June 2016,
              <https://www.rfc-editor.org/info/rfc7854>.

   [RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for
              Writing an IANA Considerations Section in RFCs", BCP 26,
              RFC 8126, DOI 10.17487/RFC8126, June 2017,
              <https://www.rfc-editor.org/info/rfc8126>.

   [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC
              2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174,
              May 2017, <https://www.rfc-editor.org/info/rfc8174>.

7.2. Informative References

   [IANA-BMP] IANA, "BGP Monitoring Protocol (BMP) Parameters", 2016,
              <https://www.iana.org/assignments/bmp-parameters/bmp-
              parameters.xhtml>.

   [IANA-PEN] IANA, "Private Enterprise Numbers", 1982,
             <http://www.iana.org/assignments/enterprise-numbers/>.

   [RFC7011] Claise, B., Ed., Trammell, B., Ed., and P. Aitken,
              "Specification of the IP Flow Information Export (IPFIX)
              Protocol for the Exchange of Flow Information", STD 77,
              RFC 7011, DOI 10.17487/RFC7011, September 2013,
              <https://www.rfc-editor.org/info/rfc7011>.

Authors' Addresses

   Paolo Lucente
   NTT
   Siriusdreef 70-72
   2132 Hoofddorp
   Netherlands

   Email: paolo@ntt.net

   Yunan Gu
   Huawei
   Huawei Bld., No.156 Beiqing Rd.
   Beijing
   100095
   China

   Email: guyunan@huawei.com