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Support for Enterprise-specific TLVs in the BGP Monitoring Protocol

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 a TLV message body, ie. Route Mirroring and Stats Reports, or optional TLVs at the end of a BMP message, ie. Peer Up and Peer Down. 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.

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Table of Contents

- [1. Introduction](#)
- [2. Terminology](#)
- [3. TLV encoding](#)
 - [3.1. IANA-registered TLV encoding](#)
 - [3.2. Enterprise-specific TLV encoding](#)
 - [3.3. TLV encoding remarks](#)
- [4. Security Considerations](#)
- [5. Operational Considerations](#)
- [6. IANA Considerations](#)
- [7. References](#)
 - [7.1. Normative References](#)
 - [7.2. Informative References](#)
- [Acknowledgements](#)
- [Authors' Addresses](#)

1. Introduction

The BGP Monitoring Protocol (BMP) is defined in [RFC 7854](#) [[RFC7854](#)]. Support for 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 for various reasons such as delivering a pre-standard product. This aligns with [Section 4.1 of](#) [[RFC8126](#)].

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 for testing. This aligns with [Section 4.2 of](#) [[RFC8126](#)].

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 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 4.7 of \[RFC7854\]](#) (Route Mirroring 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.

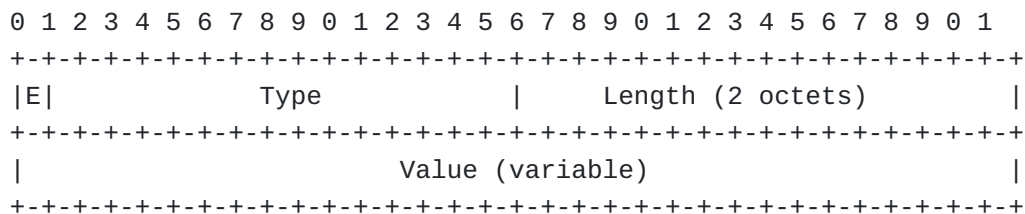


Figure 1

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 TLV length. Comprising length of IANA PEN plus TLV value,

*4 octets of IANA Private Enterprise Number [IANA-PEN](#) [[IANA-PEN](#)]

*0 or more octets of TLV Value.

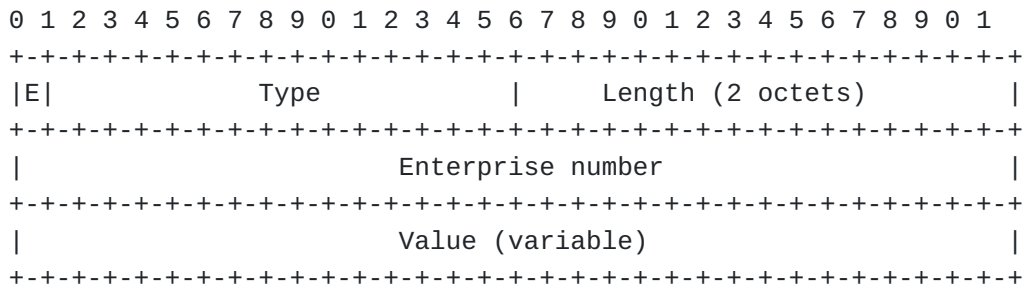


Figure 2

In case of indexed TLVs, as defined by [TLV support for BMP Route Monitoring and Peer Down Messages](#) [I-D.ietf-grow-bmp-tlv], the index value follows the Enterprise number.

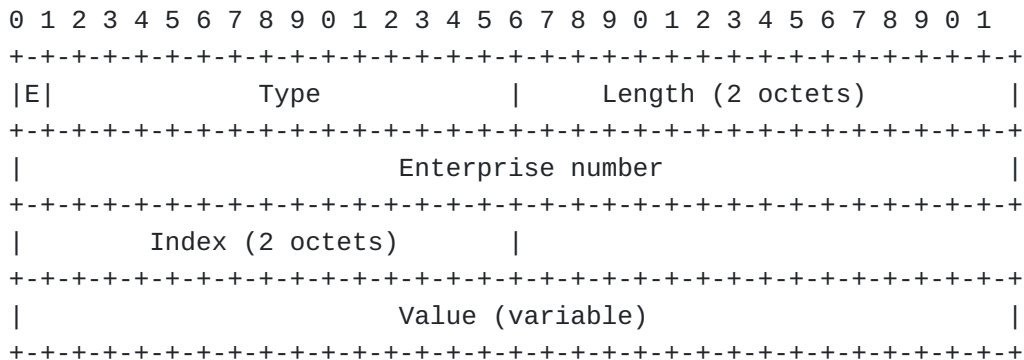


Figure 3

3.3. TLV encoding remarks

The TLV encoding specified in this document applies to all existing BMP Message Types and their namespaces defined in [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).

Future BMP Message Types MUST make use of the TLV encoding defined in this document.

This document refers to [TLV support for BMP Route Monitoring and Peer Down Messages](#) [[I-D.ietf-grow-bmp-tlv](#)] for any recommendations regarding the use of TLVs (ie. repetitions, ordering, etc.).

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

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