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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.

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Internet-Draft

BMP TLV EBIT

January 2022

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## [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.

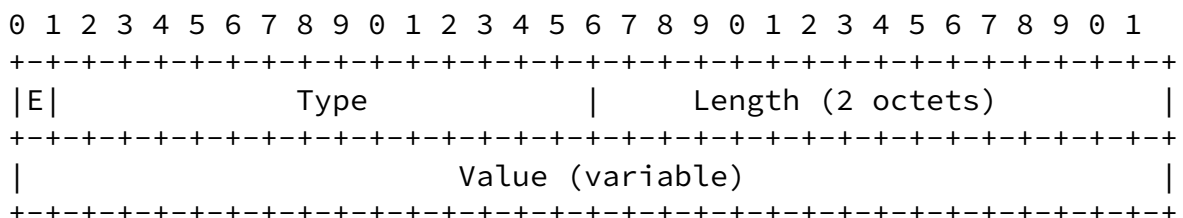


Figure 1

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.

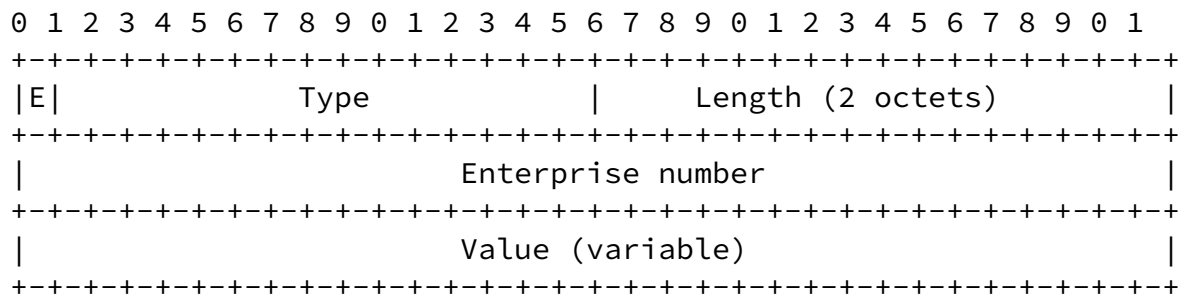


Figure 2

### 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>>.

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