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TLV support for BMP Route Monitoring and Peer Down Messages
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Abstract

Most of the message types defined by the BGP Monitoring Protocol (BMP) do provision for optional trailing data; however Route Monitoring message (to provide a snapshot of the monitored Routing Information Base) and Peer Down message (to indicate that a peering session was terminated) do not. Supporting optional data in TLV format across all BMP message types allows for an homogeneous and extensible surface that would be useful for the most different use-cases that need to convey additional data to a BMP station. While this document does not want to cover any specific utilization scenario, it defines a simple way to support optional TLV data in all message types.

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[1.](#) Introduction

The BGP Monitoring Protocol (BMP) is defined in [RFC 7854](#) [[RFC7854](#)].

The Route Monitoring message consists of:

- o Common Header
- o Per-Peer Header
- o BGP Update PDU

The Peer Down Notification message consists of:

- o Common Header
- o Per-Peer Header
- o Reason
- o Data (only if Reason code is 1, 2 or 3)

This means that both Route Monitoring and Peer Down messages have a non-extensible format. In the Route Monitoring case this is limiting if wanting to transmit characteristics of transported NLRIs (ie. to help stateless parsing) or vendor-specific data; in the Peer Down case this is limiting if wanting to match TLVs shipped with the Peer Up. The proposal of this document is to bump the BMP version, for backward compatibility, and allow all message types to provision for trailing TLV data.

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

TLV data type is already defined in [Section 4.4 of \[RFC7854\]](#) for the Initiation and Peer Up message types. A TLV consists of:

- o 2 octets of TLV Type,
- o 2 octets of TLV Length,
- o 0 or more octets of TLV Value.

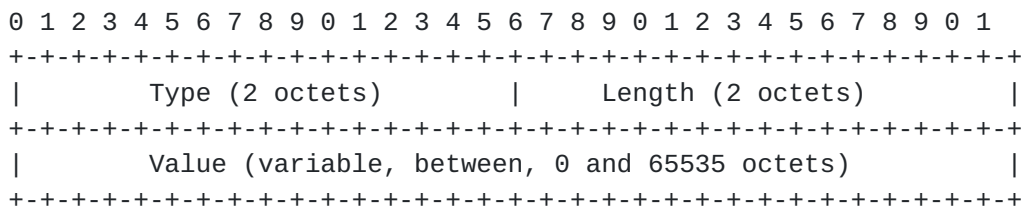


Figure 1

TLVs SHOULD be sorted by their code point. 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.

4. BMP Message Format

4.1. Common Header

[Section 4.1 of \[RFC7854\]](#) defines the Common Header. While the structure remains unaltered, the following two definitions are changed:

- o Version: Indicates the BMP version. This is set to '4' for all messages.
- o Message Length: Length of the message in bytes (including headers, data, encapsulated messages and TLV data if any)

4.2. TLV data in Route Monitoring

The Route Monitoring message type is defined in [Section 4.6 of \[RFC7854\]](#). The BGP Update PDU [Section 4.3 of \[RFC4271\]](#) MAY be followed by TLV data. This document defines the following new codes to help stateless parsing of BGP Update PDUs:

- o Type = TBD1: the BGP Update PDU is encoded with support for 4-octet AS number capability [RFC 6793 \[RFC6793\]](#), value MUST be boolean.
- o Type = TBD2: the BGP Update PDU is encoded with ADD-PATH capability [RFC 7911 \[RFC7911\]](#), value MUST be boolean.
- o Type = TBD3: the BGP Update PDU is encoded with Multiple Labels capability [RFC 8277 \[RFC8277\]](#), value MUST be boolean.

4.3. TLV data in Peer Down

The Peer Down Notification message type is defined in [Section 4.9 of \[RFC7854\]](#). In case of Reason code 1 and 3, a BGP Notification PDU follows; the PDU MAY be followed by TLV data. In case of Reason code 2, a 2-byte field to give additional FSM info follows; this field MAY be followed by TLV data. For all other Reason codes, TLV data MAY follow the Reason field.

4.4. TLV data in other BMP messages

All other message types defined in [RFC7854 \[RFC7854\]](#) do already provision for TLV data. It is RECOMMENDED that all future BMP message types will provision for trailing TLV data.

5. Security Considerations

It is not believed that this document adds any additional security considerations.

6. IANA Considerations

This document defines the following new TLV types for BMP Route Monitoring and Peer Down messages ([Section 4.2](#)):

- o Type = TBD1: Support for 4-octet AS number capability. The value field contains a boolean value. 1 if the BGP Update PDU enclosed in the Route Monitoring message was encoded according to the capability.
- o Type = TBD2: ADD-PATH capability. The value field contains a boolean value. 1 if the BGP Update PDU enclosed in the Route Monitoring message was encoded according to the capability.
- o Type = TBD3: Multiple Labels capability. The value field contains a boolean value. 1 if the BGP Update PDU enclosed in the Route Monitoring message was encoded according to the capability.

7. Normative References

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