Export of GTP-U Information in IPFIX

draft-ietf-opsawg-ipfix-gtpu-03

Enabling insights in GTP forwarding plane by adding GTP-U dimensions

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17 Mar 2025

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Draft Status since last review @ IETF121

Updates since IETF 121

- Liaison statement issued with 3GPP and requested 3GPP TSG SA WG5 and 3GPP TSG CT WG4 to review this draft.
- Addressed initial comments (version 01 thro 02) from Med on updating the IE description (Sec-5) and Use case section (Sec-4) by giving additional references to slicing related info.

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IPFIX entities in context of the GTP-U (1)

- **gtpuFlags IE-505**

  8-bit flags field indicating the version of GTP-U header, protocol type, and presence of extension header, sequence number and N-PDU number defined in Section 5.1 of the 3GPP specification [TS.29281]. The bits are exported as observed.

- **gtpuMsgType IE-506**

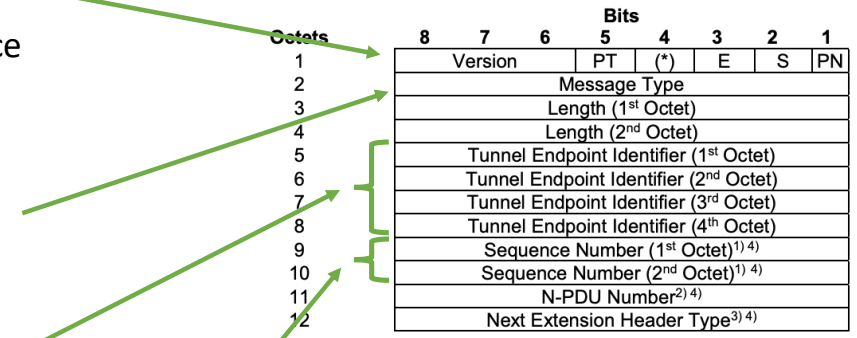
  8-bit field which indicates the type of the GTP-U message.

- **gtpuTEid IE-507**

  32-bit tunnel endpoint identifier field unambiguously identifies a tunnel endpoint in the receiving GTP-U protocol entity for a given UDP/IP endpoint. The receiving side of a GTP tunnel locally assigns the TEID value the transmitting side has to use. The TEID values are exchanged between tunnel endpoints using control plane messages.

- **gtpuSequenceNum IE-508**

  16-bit sequence number field defined in the GTP-U. This field is interpreted based on the sequence number flag value from gtpuFlags.



Octets	Bits 8	7	6	5	4	3	2	1
1	Version			PT	(*)	E	S	PN
2	Message Type							
3	Length (1st Octet)							
4	Length (2nd Octet)							
5	Tunnel Endpoint Identifier (1st Octet)							
6	Tunnel Endpoint Identifier (2nd Octet)							
7	Tunnel Endpoint Identifier (3rd Octet)							
8	Tunnel Endpoint Identifier (4th Octet)							
9	Sequence Number (1st Octet)1) 4)							
10	Sequence Number (2nd Octet)1) 4)							
11	N-PDU Number2) 4)							
12	Next Extension Header Type3) 4)							

NOTE 0: (*) This bit is a spare bit. It shall be sent as '0'. The receiver shall not evaluate this bit.
NOTE 1: 1) This field shall only be evaluated when indicated by the S flag set to 1.
NOTE 2: 2) This field shall only be evaluated when indicated by the PN flag set to 1.
NOTE 3: 3) This field shall only be evaluated when indicated by the E flag set to 1.
NOTE 4: 4) This field shall be present if and only if any one or more of the S, PN and E flags are set.

Figure 5.1-1: Outline of the GTP-U Header

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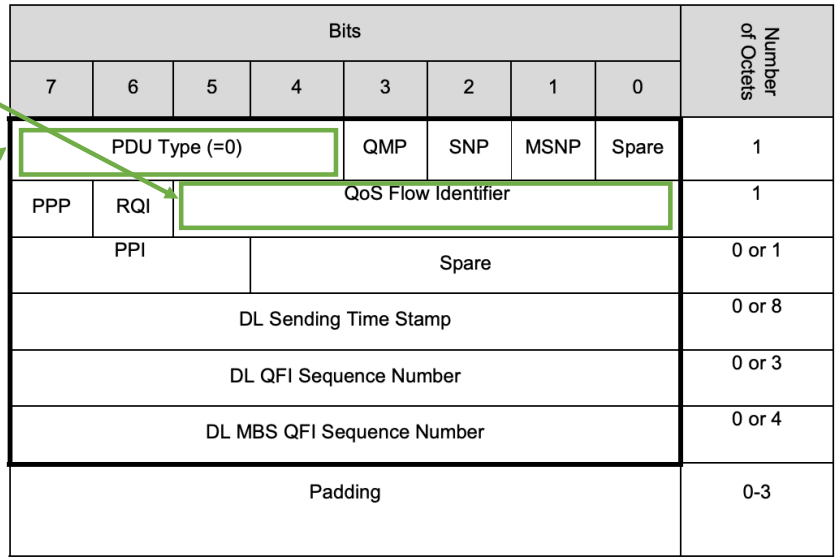
IPFIX entities in context of the GTP-U (2)

- **gtpuQFI IE-509**

  6-bit QoS flow identifier ield defined in PDU Session Container extension header of GTP-U. This is used to determine the QoS flow and QoS profile which are associated with the received packet. The presense of this extension header is interpreted based on the extension header flag value from gtpuFlags.

- **gtpuPduType IE-510**

  4-bit PDU type field defined in PDU Session Container extension header of GTP-U. This field indicates the structure of the PDU session user plane frame. The presense of this extension header is interpreted based on the extension header flag value from gtpuFlags.



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Comments received on version -03

Reference - https://mailarchive.ietf.org/arch/msg/opsawg/btkgFDOLGXZ7tp2Onh1pGwA-bVQ/

1. Should we add a statement about the base 3GPP release used to define the IEs?
2. Is it worth to also report the extension header chain? Also, the peer tunnel endpoint?
3. gtpuFlags
   - This also cover the version. Not sure «flags» is accurate here. A better name is needed if the version is also included.
   - (5.1 description) I would say this corresponds to the first byte of the header. The internal structure may change in the future (associate a meaning with the remaining bit, etc.). The current description may be stale then.
   - I would insist that the bits are exported as observed. This allows, for example, to export the current unassigned bit even if no meaning is associated with it yet.
4. As the header length is variable, is it worth to also export the length as a separate IE?
5. At the collector side, the presence of this IE when the S bit is unset should be handled as an anomaly. I would add some text to cover this. Also, indicate which one takes precedence.
6. pdutype: I like the new text (s/presense/presence, though). However, I would be more explicit that if this IE is present when E bit is not set is considered as an anomaly. In such case, which information takes precedence?
7. Can we cover how IPFIX can help to cover: «When using GTP-U over IPv6 (see IETF RFC 8200 [36]), the UDP checksum shall not be set to zero by the sending GTP-U entity unless it is ensured that the peer GTP-U entity and the path in-between supports UDP zero checksum. NOTE 1: GTP-U entities complying with an earlier version of the specification or on path IPv6 middleboxes can implement IPv6 as specified in IETF RFC 2460 [15] and discard UDP packets containing a zero checksum. »
8. What is an “intermediate UPF”? “or Uplink Classifier”: This corresponds to which entity in the 3GPP architecture?

Addressed comments – 1, 3, 5 - 8, Seeking inputs from WG on 2 & 4

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Questions to the working group

1. *Is it worth to also report the extension header chain?*
   We could think of two options to report the GTP-U extension header chain
   a) Export complete GTP-U header, for example gtpuHeaderSection
   b) Export only the extension headers, for example gtpuExtHeaderSection

2. *As the header length is variable, is it worth to also export the length as a separate IE*

We authors believe these are good IEs to include. Our preference on (1) would be option 'a'. Any objections on the same?

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Next Steps for -04

- Updated IE description will be reflected to IANA registry
- Pending output of working group discussion, adding additional IPFIX entities as example: gtpuHeaderSection, gtpuTotalHeaderLength
- Review and address further comments from Med's on version 03 – In progress