Export of Encapsulation Layer Information in IPFIX

draft-liu-opsawg-ipfix-muti-layer

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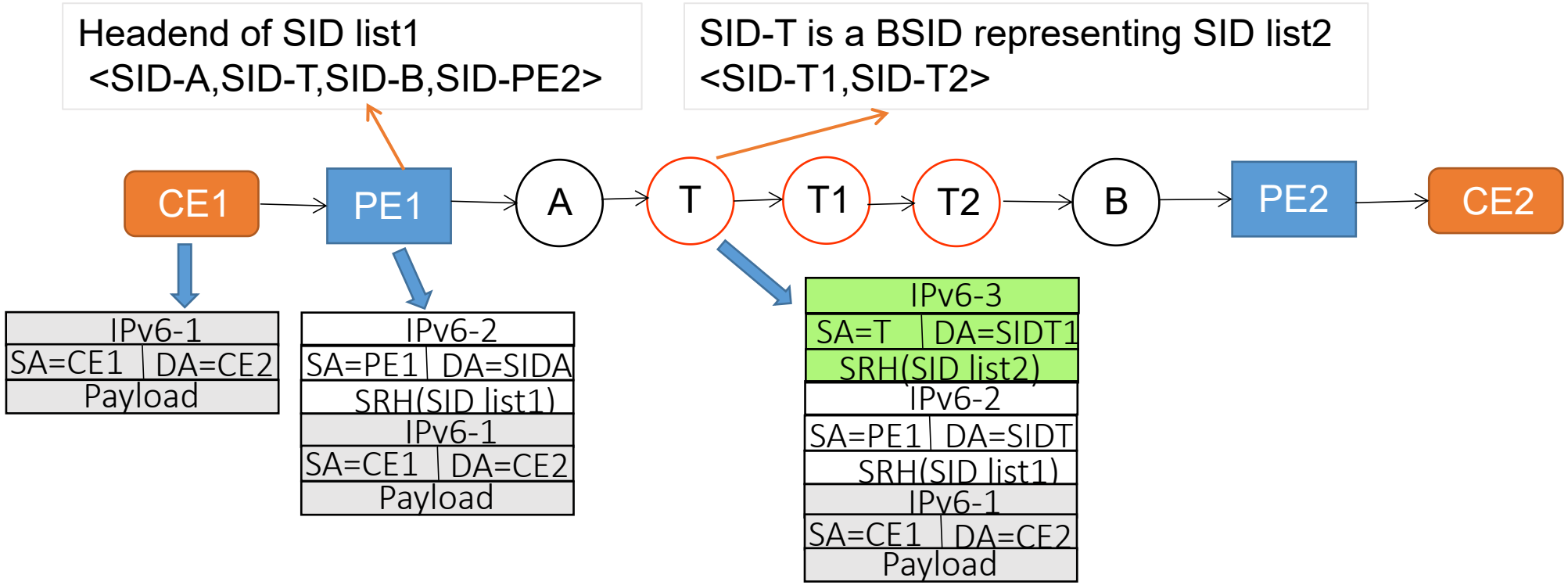
Background and Motivation

➢ Packets with multi-layer network encapsulation become more and more common in the network, typical scenarios include IP-in-IP, even IP-in-IP-in-IP



➢ A typical use case when monitoring the traffic flow:

- Which tunnel are the packets steered into?
- What are the details of the inner frame?

Requirements and Gaps

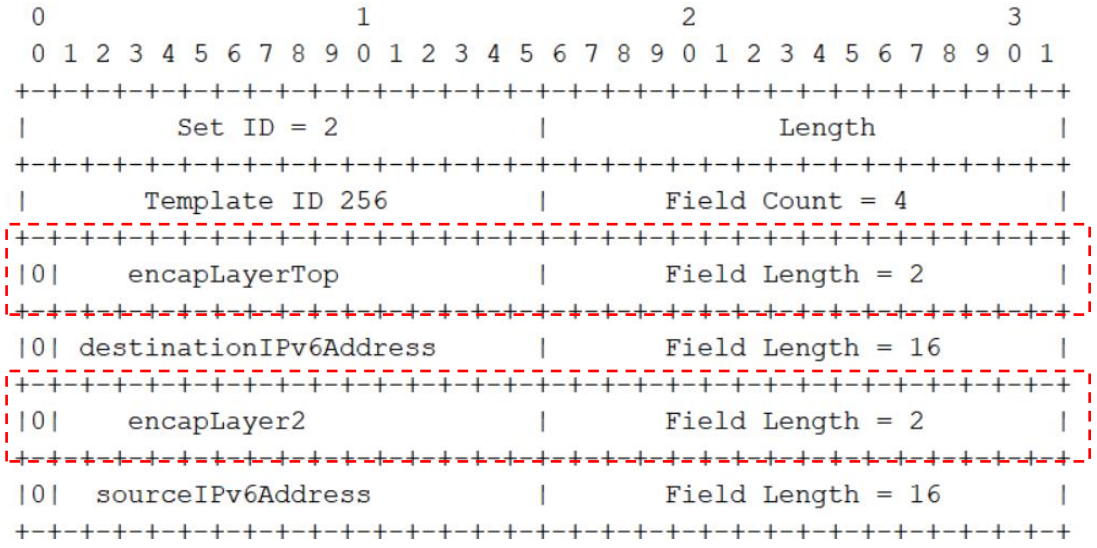
Potential Requirements

- Req-a: Collecting the same fields from both the outer and inner headers
- Req-b: Collecting only the fields from the inner packet header
- Req-c: Collecting only the fields from the outer packet header
- Req-d: Collecting different fields from the outer header (e.g, outer DA) and inner header(e.g.inner SA)

Gaps

- Req-a can be fulfilled as in [RFC7011], if the same element appears multiple times in an IPFIX template, it should be processed in order. e.g, two IEs of sourceIPv6Address in the template, the first IE should be SA of the outer header, while the second should be SA of the inner header.
- Gaps for Req-b/c/d: When receiving a IPFIX message with a certain IE(e.g, sourceIPv6Address) , the collector is not able to tell which encapsulation layer this IE belongs to.

IPFIX IEs for Encapsulate Layer



- encapLayerTop: A 16-bit identifier. Fixed value 0xFFFF

The IEs follows immediately after it till the next Encapsulation Layer IE belong to the outmost network encapsulation layer (e.g, from the outmost Ethernet header to the first IP header).

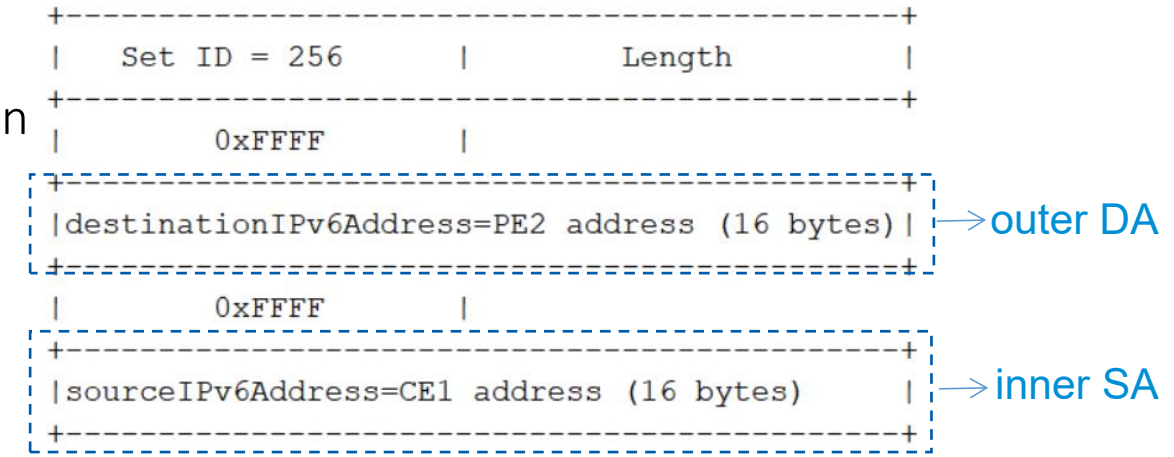
If there's not any other Encapsulation Layer IE exists in the Template, it means that all the IEs following encapLayerTop belong to the outmost network encapsulation layer.

- encapLayer2: A 16-bit identifier. Fixed value 0xFFFF

The IEs follows immediately after it till the next Encapsulation Layer IE belong to the second network encapsulation layer.

If there's not any other Encapsulation Layer IE exists in the Template, it means that all the IEs following encapLayer2 belong to the second network encapsulation layer.

- encapLayer3: … …



Operational Considerations

- To generate Flow Records with IEs for encapsulation layer included, the metering process SHOULD recognize the encapsulation layer of the corresponding fields in the packet.

- Each encapsulation layer IE SHALL NOT appear more than once more in a Template.

- For IEs that are not related with header fields, whether they are covered by scope of the encapsulation layer IE, they SHOULD be processed following the existing specifications.

Next Steps

- Welcome feedback, comments and cooperation.
  - Are you facing this problem?
  - Open to other solutions.

Thank You !