IKEv2 IPv4 Downstream Fragmentation Notification Extension

`draft-liu-ipsecme-ikev2-mtu-dect`

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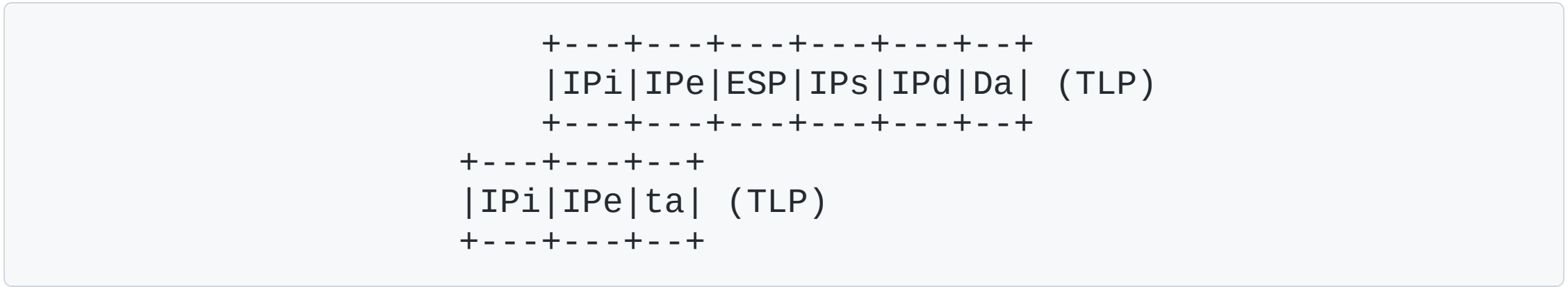
The goal of the document is to limit the reassembly operations being performed by the egress security gateway. It defines:

- The IKEv2 Link Maximum Atomic Packet
- The Packet Too Big Extension

Illustrative Example:

1. Mid-tunnel (performed by a router on N) (only for IPv4 DF=0 TLP)



2. Egress node detects fragmentation

- a) it collects IPVersion the IP version of the first fragment as well as FragLen, the fragment length
- b1) If all segments can be reassembled and the reassembled packet is properly decrypted a Link Maximum Atomic Packet Notification (LMAP) is sent on the IKEv2 channel.

```
          [IKEv2]
          <---  N( LMAP [ IPVersion, FragLen] )
```

- b2) If the packet is too big and cannot be fully processed PTB indicates LMTU of the router component of the egress node.

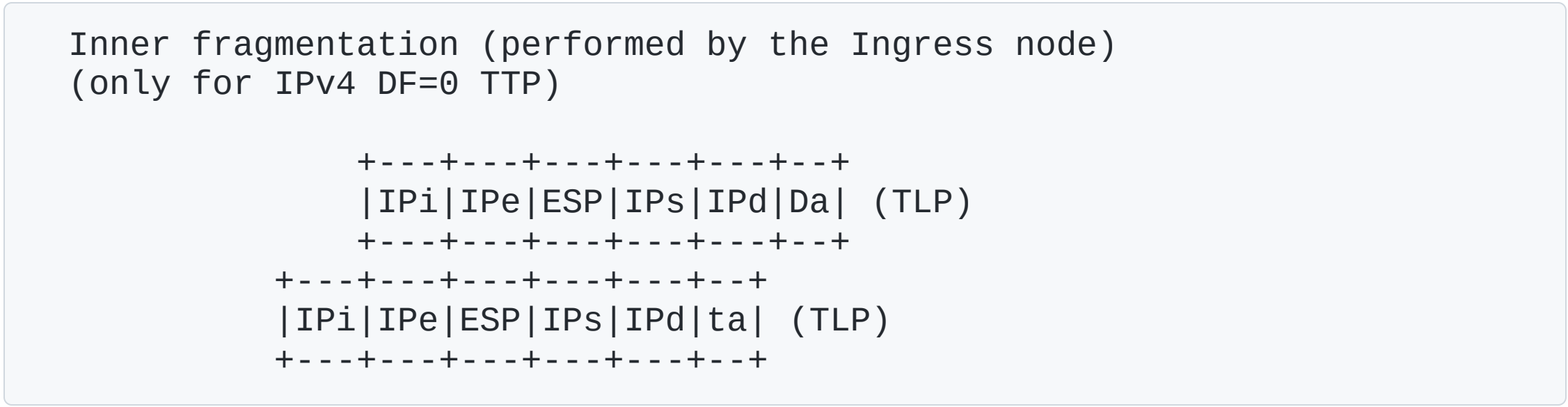
```
          [IKEv2]
          <---  N( LMAP [ IPVersion, FragLen] )
                N( PTB [LMTU, EMTU_R] )
```

3. Upon receiving the LMAP or optionally the ingress node

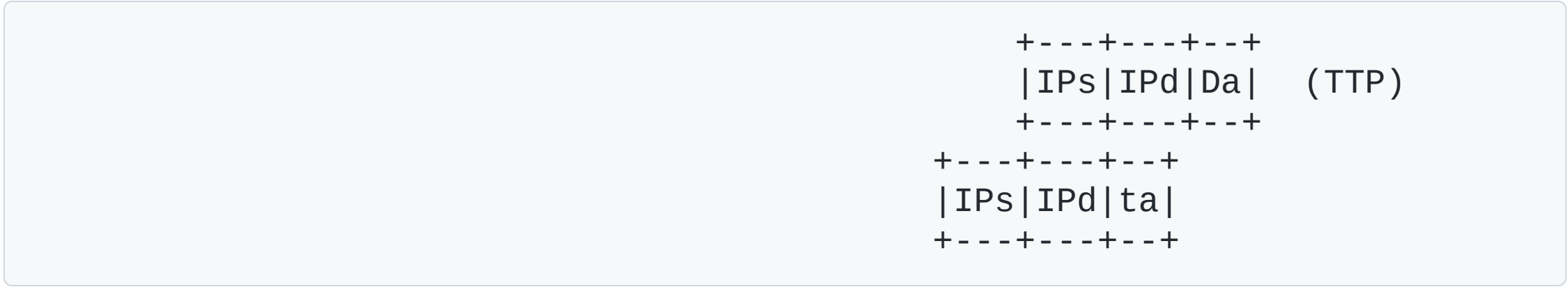
- a) Update the TMTU so that the Source performs source fragmentation with TTP packets that are not fragmented.

```
  Source fragmentation
  (IPv6 or IPv4)
    +---+---+--+
    |IPs|IPd|Da|  (TTP)
    +---+---+--+
+---+---+--+
|IPs|IPd|ta|
+---+---+--+
```

- b) Performs inner fragmentation TTP packets that exceeds the TMTU and will generate some fragments.



In both cases the egress node does not proceed to reassembly operations:



The draft has been presented and reviewed several time we took all comments into consideration.

1. PTB discussion: The IKE PTB, in our view, is largely motivated by enabling the egress interface to provide the EMTU_R (see ietf-intarea-tunnels section 4.2.2.1.
2. TMTU:

- `ietf-intarea-tunnels` considers the router component - carrying the TTP - and the interface component - handling LTP - independent. Such independence between the Tunnel MTU (for TTP) and link layer MTU for (LTP) is provided by performing outer fragmentation when needed.
- RFC4301 considers the router component can adapt to the specific needs of the interface component. **This is what we do here.**

Differentiated Services Field Codepoints Internet Key Exchange version 2 Notification

`draft-mglt-ipsecme-dscp-np`

Migault, Halpern, Parkholm, Liu

This document specifies the DSCP Notification Payload, which, in a CREATE_CHILD_SA Exchange, explicitly mentions which DSCP code points will be tunneled in the newly created tunnel.

Illustrative Example

```
 Initiator                                  Responder
-------------------------------------------------------------------
HDR, SK {IDi, [CERT,] [CERTREQ,]
    [IDr,] AUTH, SAi2,
    TSi, TSr}  -->
                                <--  HDR, SK {IDr, [CERT,] AUTH,
                                          SAr2, TSi, TSr}
HDR, SK {SA, Ni, KEi, N(DSCP, AF11, AF3)} -->
                                <--  HDR, SK {SA, Nr, KEr,
                                           N(DSCP, AF11, AF3)}
HDR, SK {SA, Ni, KEi, N(DSCP, EE)} -->
                                <--  HDR, SK {SA, Nr, KEr}
```

Thanks!