L3DL

Three Drafts from LSVR WG

draft-ietf-lsvr-l3dl

draft-ietf-lsvr-l3dl-signing

draft-ietf-lsvr-l3dl-ulpc

IDR Interim 2021.10.18

randy@psg.com, sra@hactrn.net, keyur@arrcus.com, housley@vigilsec.com

Primary Goal (2018)

Layer 3 Topology Discovery and Liveless for LSVR / BGP-SPF

Find Neighbor(s)

Learn L3 P2P Addresses

Configure BGP/SPF

L3DL

Layer 3 Discovery & Liveness

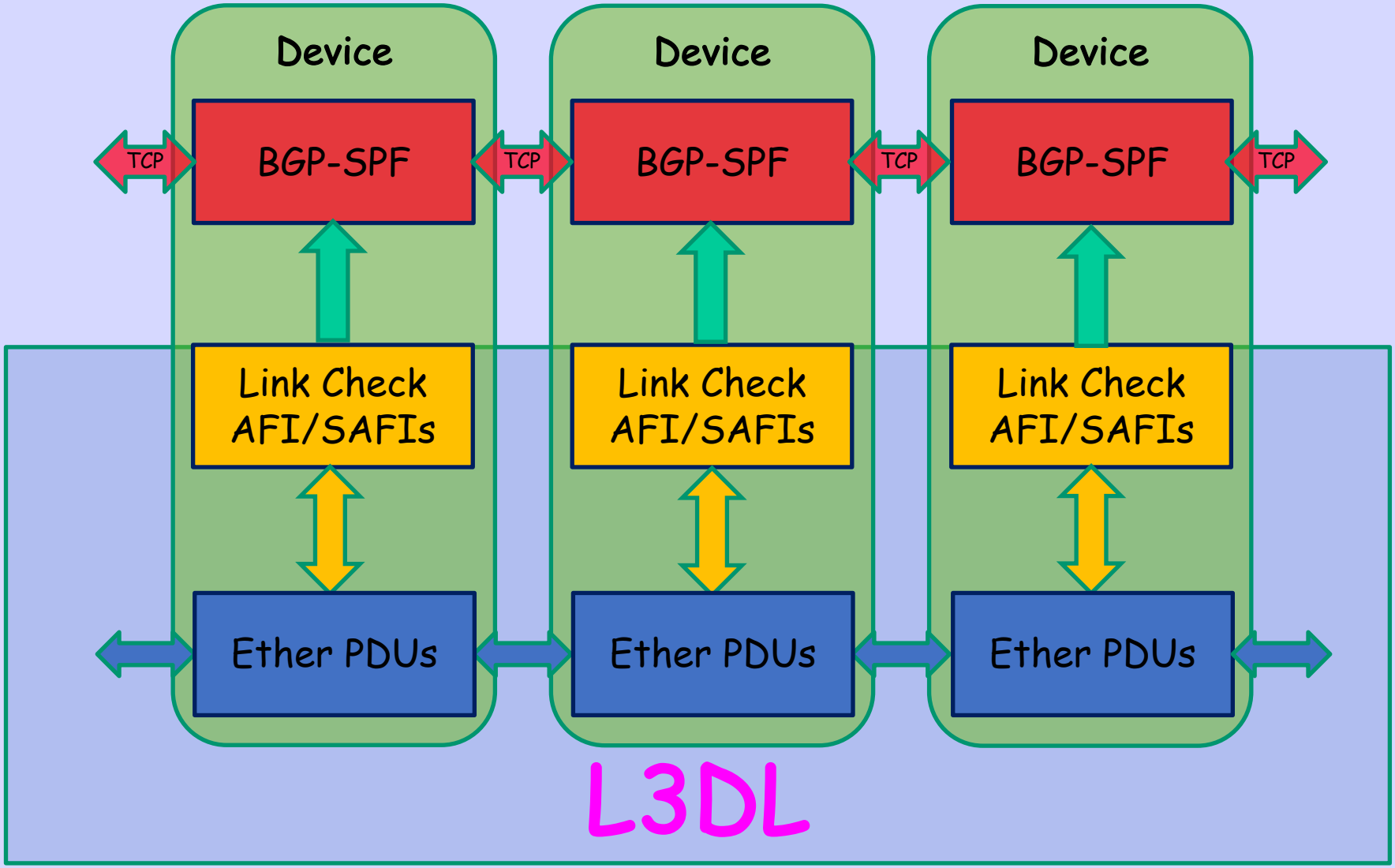
draft-ietf-lsvr-l3dl

IDR Interim

2021.10.18

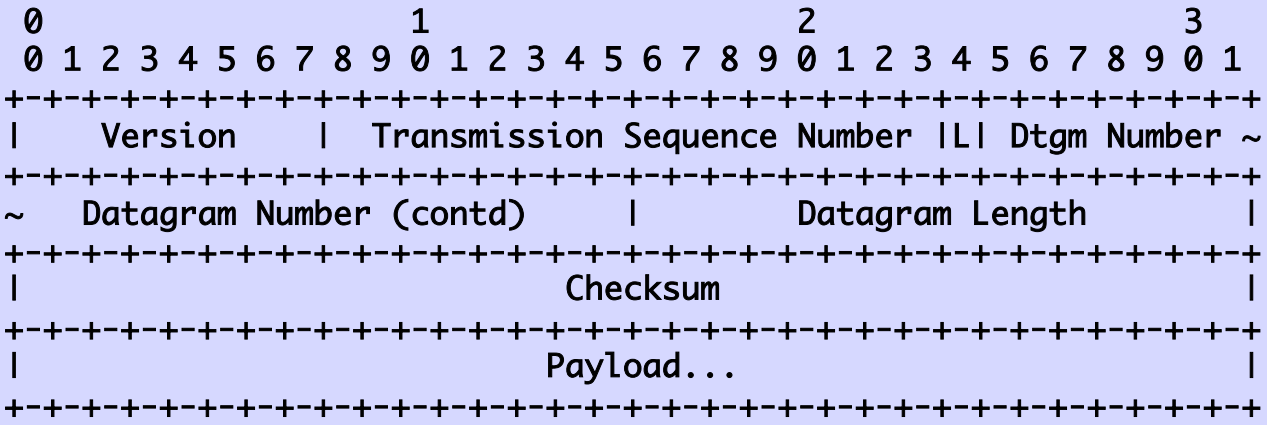
randy@psg.com, sra@hactrn.net, keyur@arrcus.com

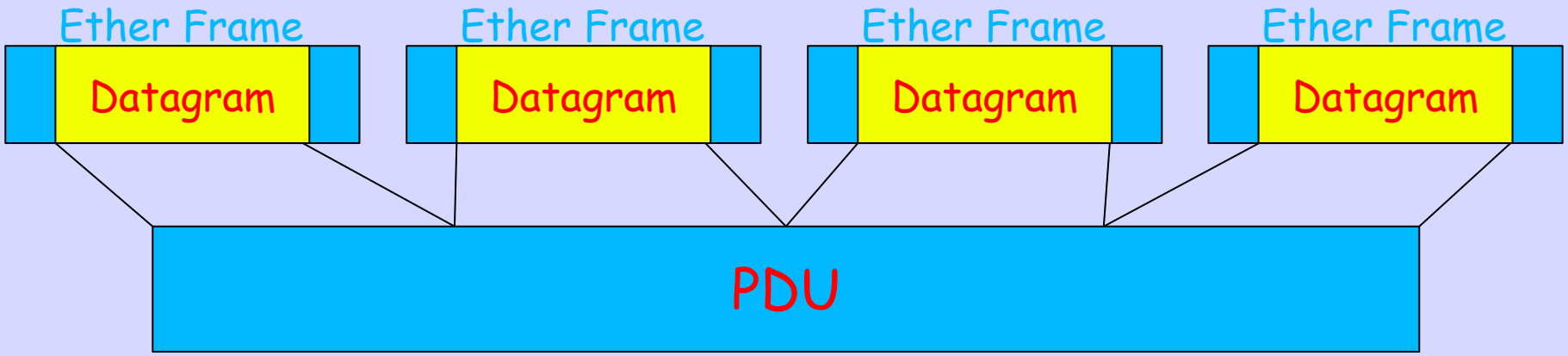
L2 Discover L3 Attrs

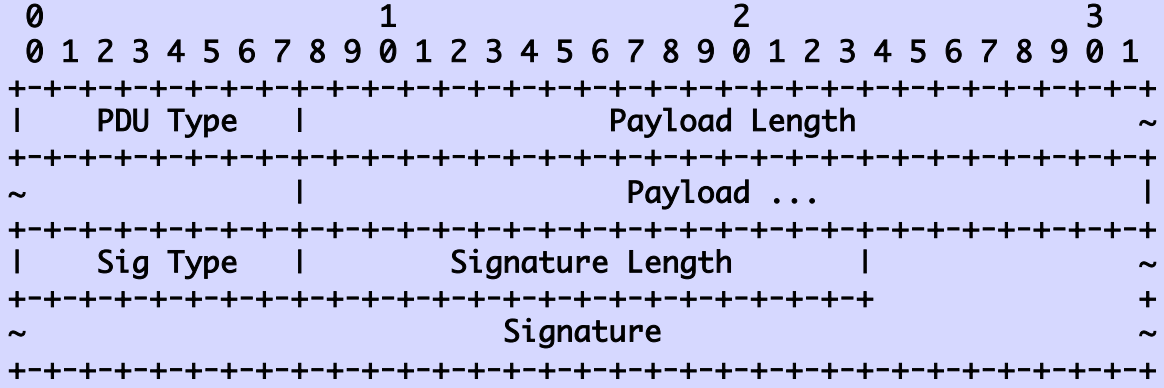


This is NOT a Routing Protocol

Discovers the Layer 3 Addresses on a PointToPoint Link







Layer 2 Transport can handle 2^32 octet PDUs

2^24 Datagrams (in Ethernet Frames)
2^16 Octets/Datagram (except it is a Frame)

Big PDUs Over Ethernet

Jörg Ott did a
Very Helpful
Transport Directorate
Early Review

Why not TCP?

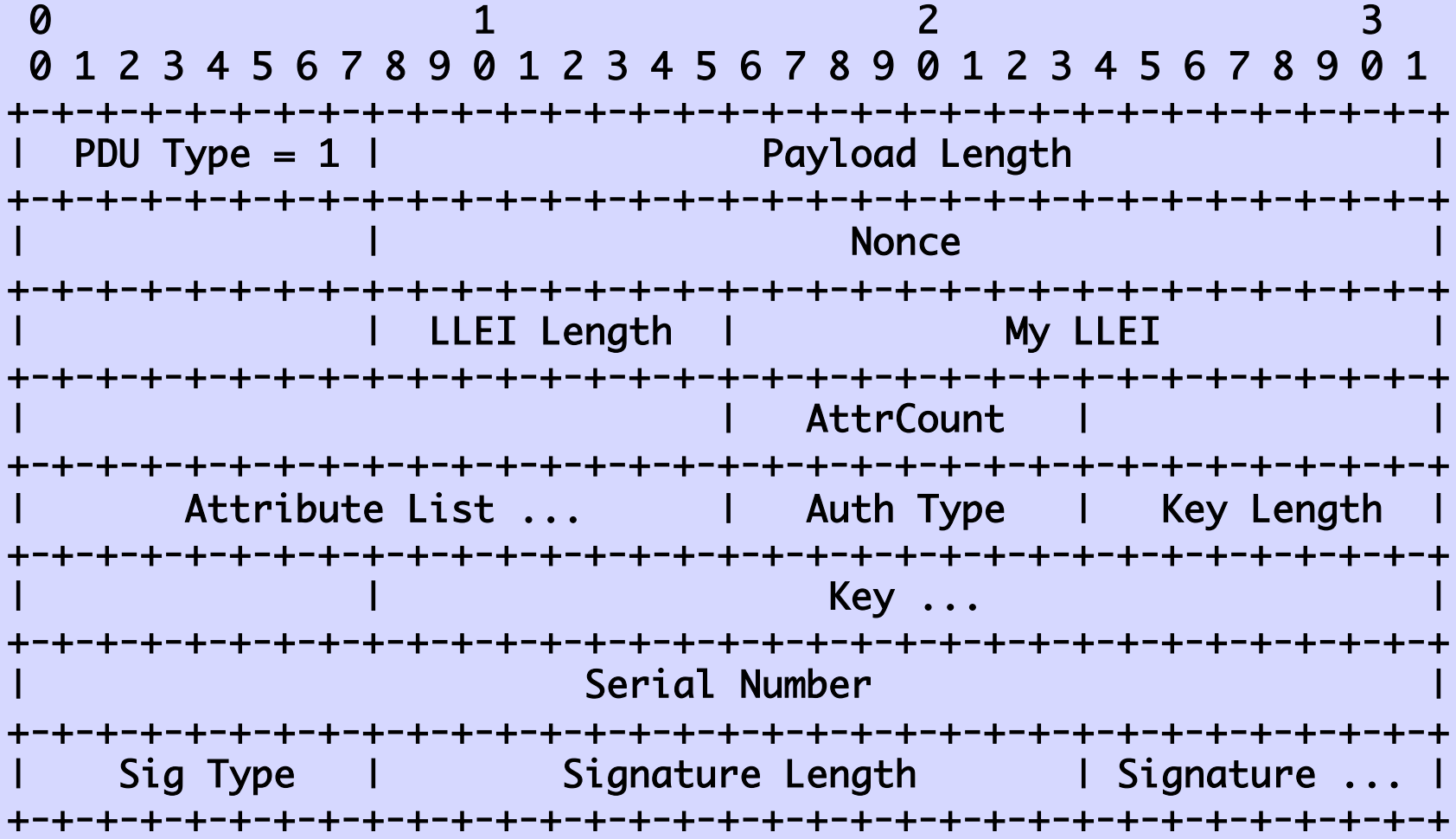
- When this runs, there are no IP Addresses
- This protocol is to Learn L3 Addresses
- So it is a cheap TCP-like protocol
- Reassembly of out of order Datagrams
- Retransmission with Back-off
- PDUs are ACKnowledged
- Long Lived Sessions
- ...

Fully Stateful
Session Per Peer

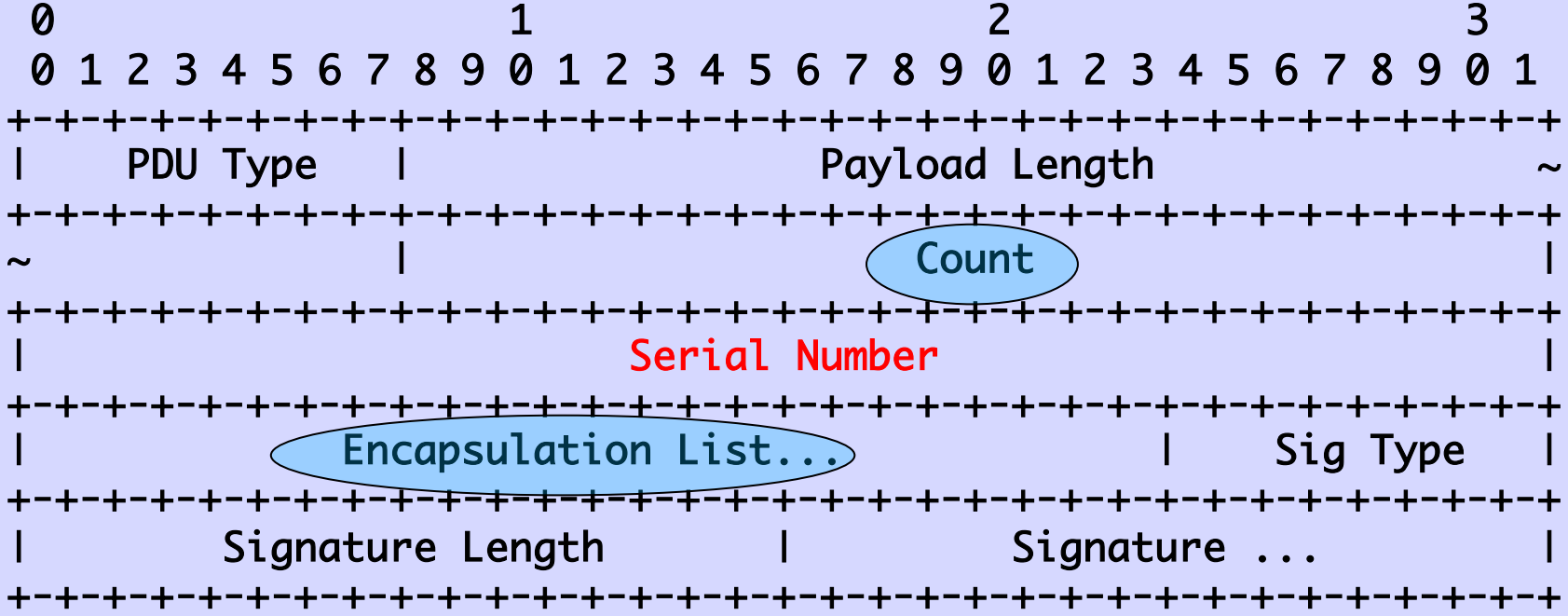
Graceful Restart

State May Be Resumed
á la BGP

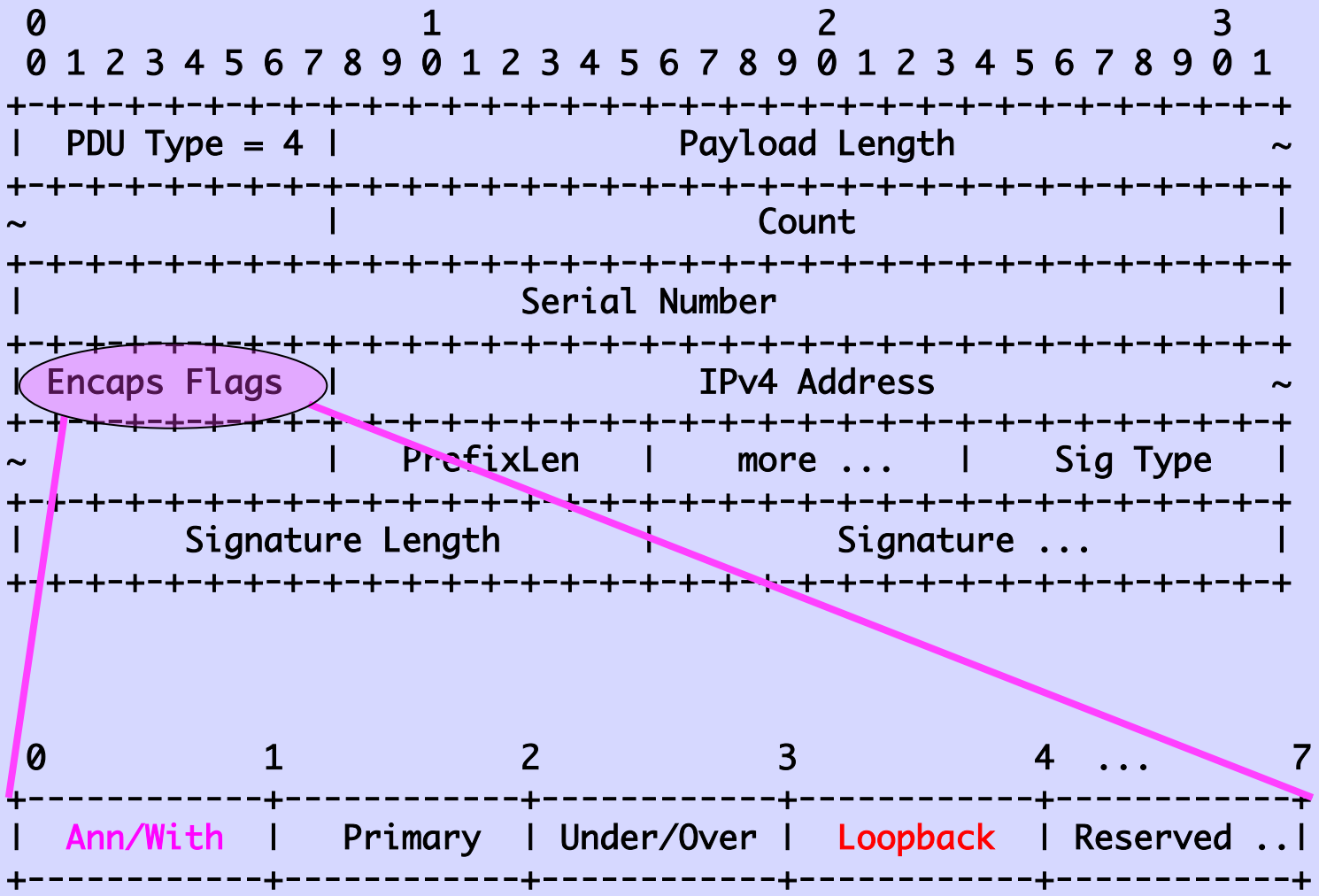
OPEN PDU



Encaps etc PDUs



Announce/Withdraw



Meant to Support BGP/SPF in DataCenter

I.e. Simple Topology so no Multicast Storms

We have Two Implementations One Python3 (LSOE) One in Golang

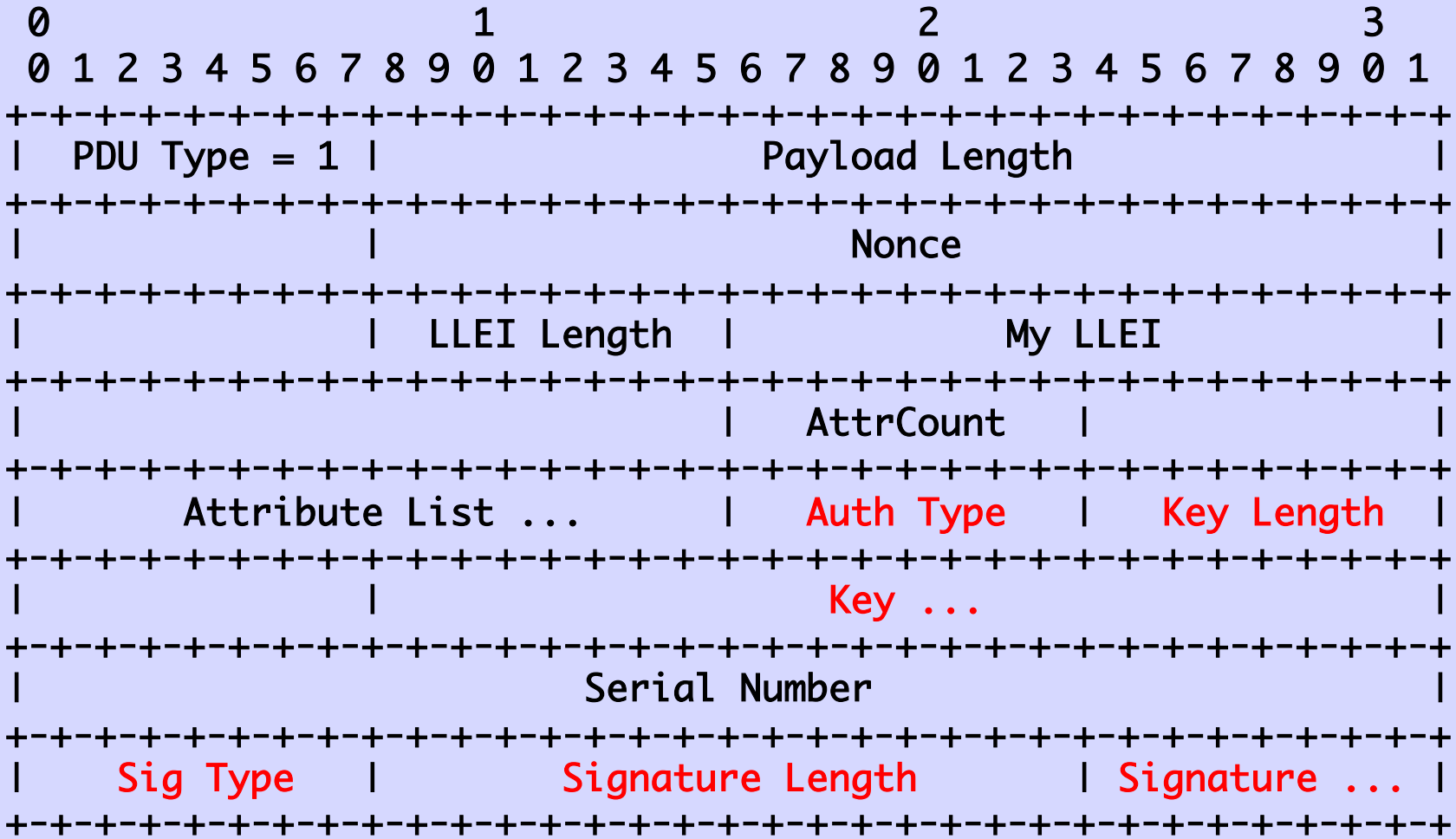
L3DL-Signing
Layer 3 Discovery and Liveness Signing
draft-ietf-lsvr-l3dl-signing

IDR Interim

2021.10.17

randy@psg.com, sra@hactrn.net, housley@vigilsec.com

OPEN PDU



PDU Sender Signing

- The Key in the OPEN PDU SHOULD be the public key of an asymmetric key pair.
- The sender signs with the private key, of course.
- The device sending the OPEN may use one key for all links, a different key for each link, or some aggregation(s) thereof

Two Flavors

Trust on First Use (TOFU)

PKI Based

Trust on First Use (TOFU)

- The OPEN key is generated on the sending device
- It is believed without question by the receiver
- Used to verify all subsequent PDUs from the same sender with the same Key Type

PKI-Based Keying

- An enrollment step is performed
- The public key is put into a certificate, which is signed by the the operational environment's trust anchor
- The relying party can be confident that the public key is under control of the identified L3DL protocol entity

Do Not Be Afraid

This is NOT X.509

- These need not be X.509 certificates
- X.509 is much more complicated than we need
- They are just signatures of one key (the session key supplied in the Key field of the OPEN PDU) by another key (the trust anchor)
- Every device must have TA burned in

Verify is the Same

- The two methods are indistinguishable
- The key provided in the OPEN PDU is used to verify the signatures of subsequent PDUs
- The difference that PKI-based keys may be verified against the trust anchor when the OPEN PDU is received

The Choice of Which Keying is Left to the Operator

L3DL-ULPC

Upper Layer Protocol Configuration

draft-ietf-lsvr-l3dl-ulpc

IDR Interim

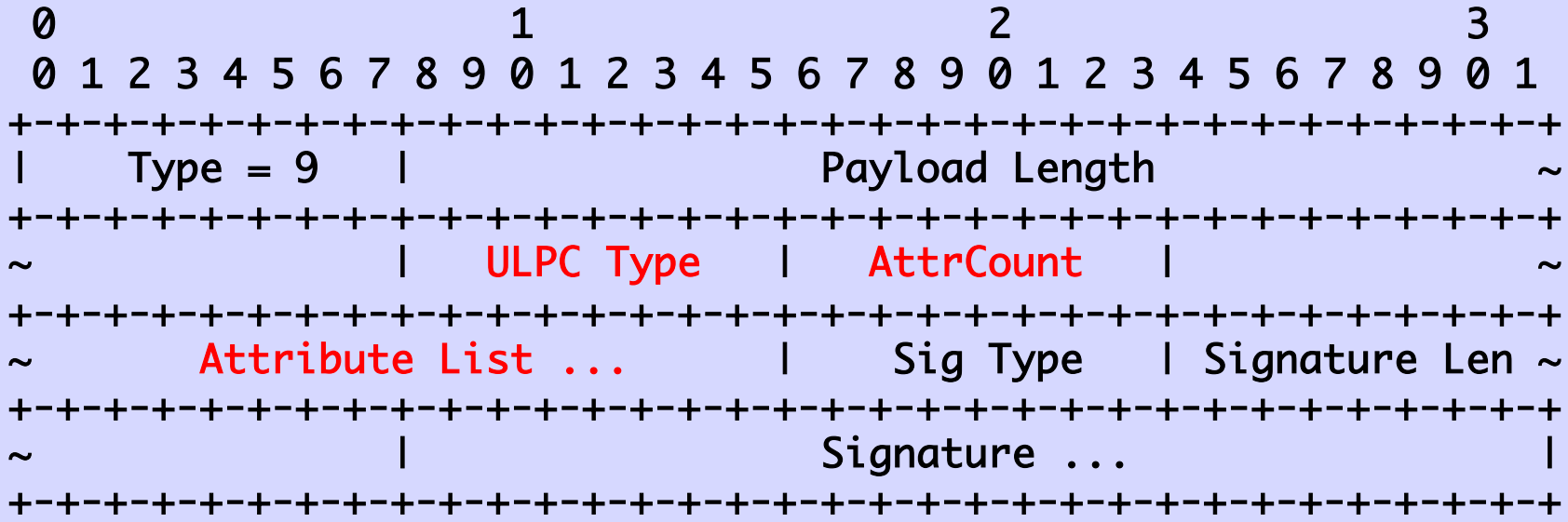
2021.10.28

randy@psg.com, sra@hactrn.net, keyur@arrcus.com

Meant to Allow Config of Arbitrary L3+ Protocols

So Far Only Defined for BGP as BGP needed for BGP/SPF in DataCenter

L3DL PDU for ULPC

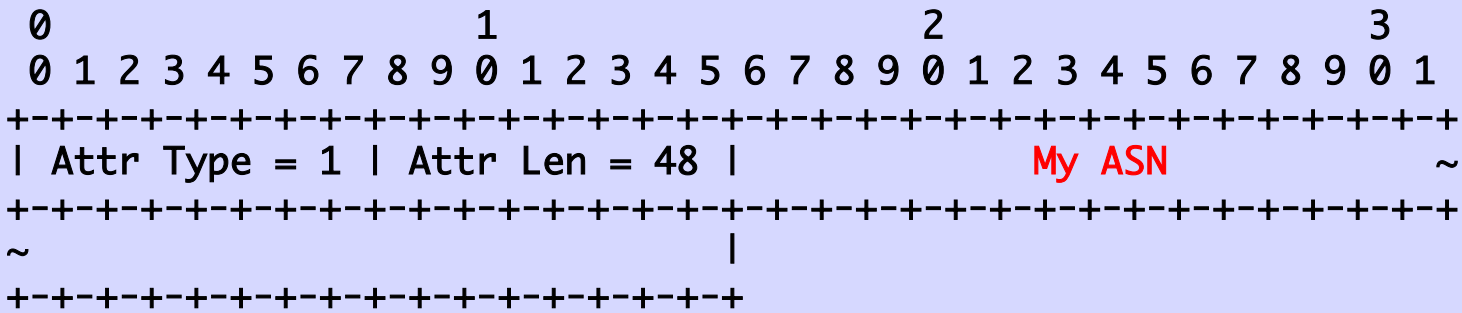


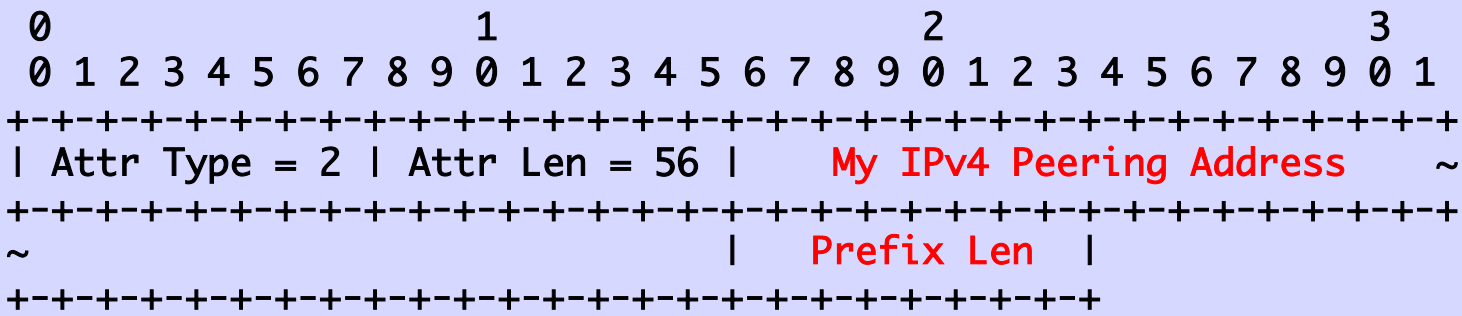
Provide the minimal set of configuration parameters for BGP OPEN to succeed

Not to replace or conflict with data exchanged by BGP OPEN

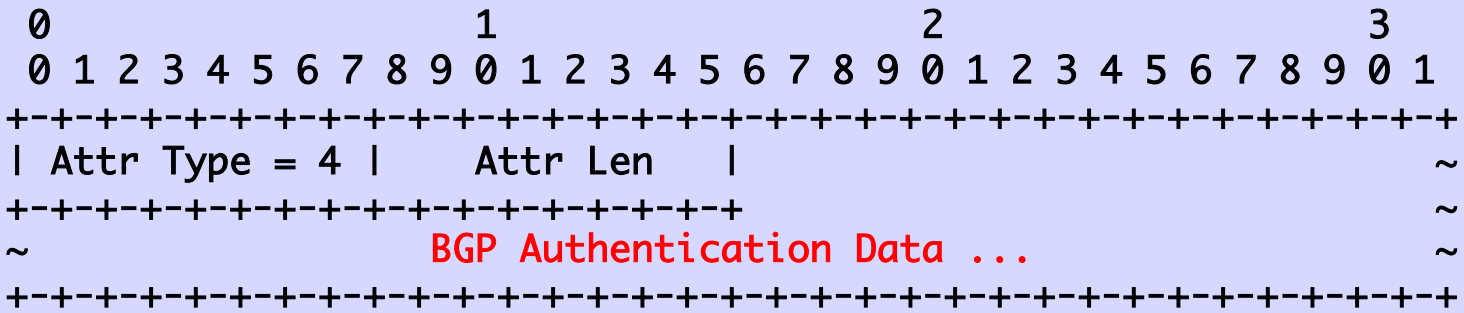
Multiple sources of truth are a recipe for complexity and pain

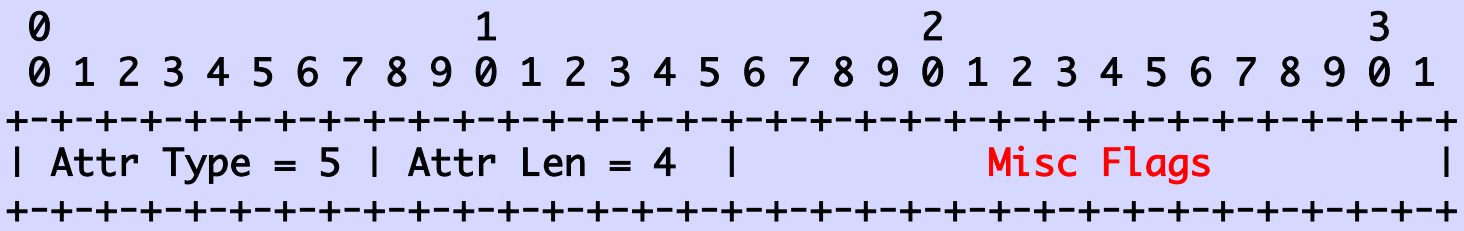
AS and Peering IP





Auth Data and GSTM

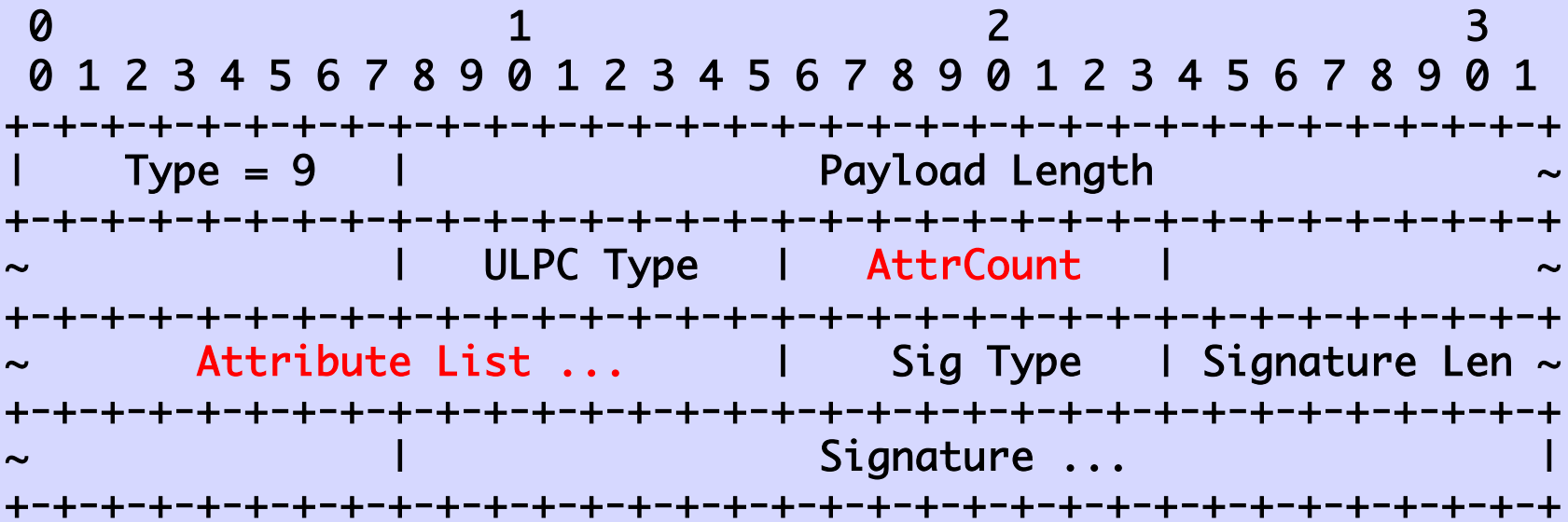


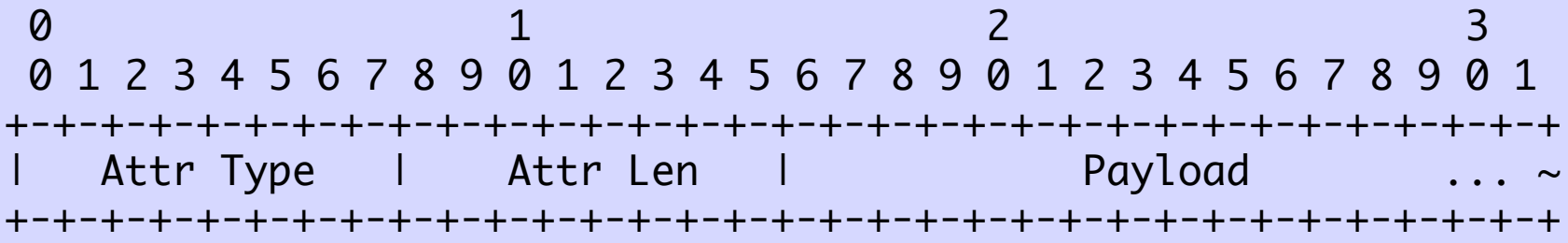


The only Flag Currently Defined is GSTM

Yes, there is one for IPv6 ☺

Arbitrary Attributes





And the Base L3DL Protocol Allowed and Marked Loopbacks etc.

That's It

We would want to hack to better fit IDR

e.g. Massive PDUs for Hundreds of Address Encapsulations Not Needed

That's Really It ☺