Lightweight 4over6

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SD-nat (aka stateless DS-Lite)

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Lightweight DS-Lite

(twice as light!)

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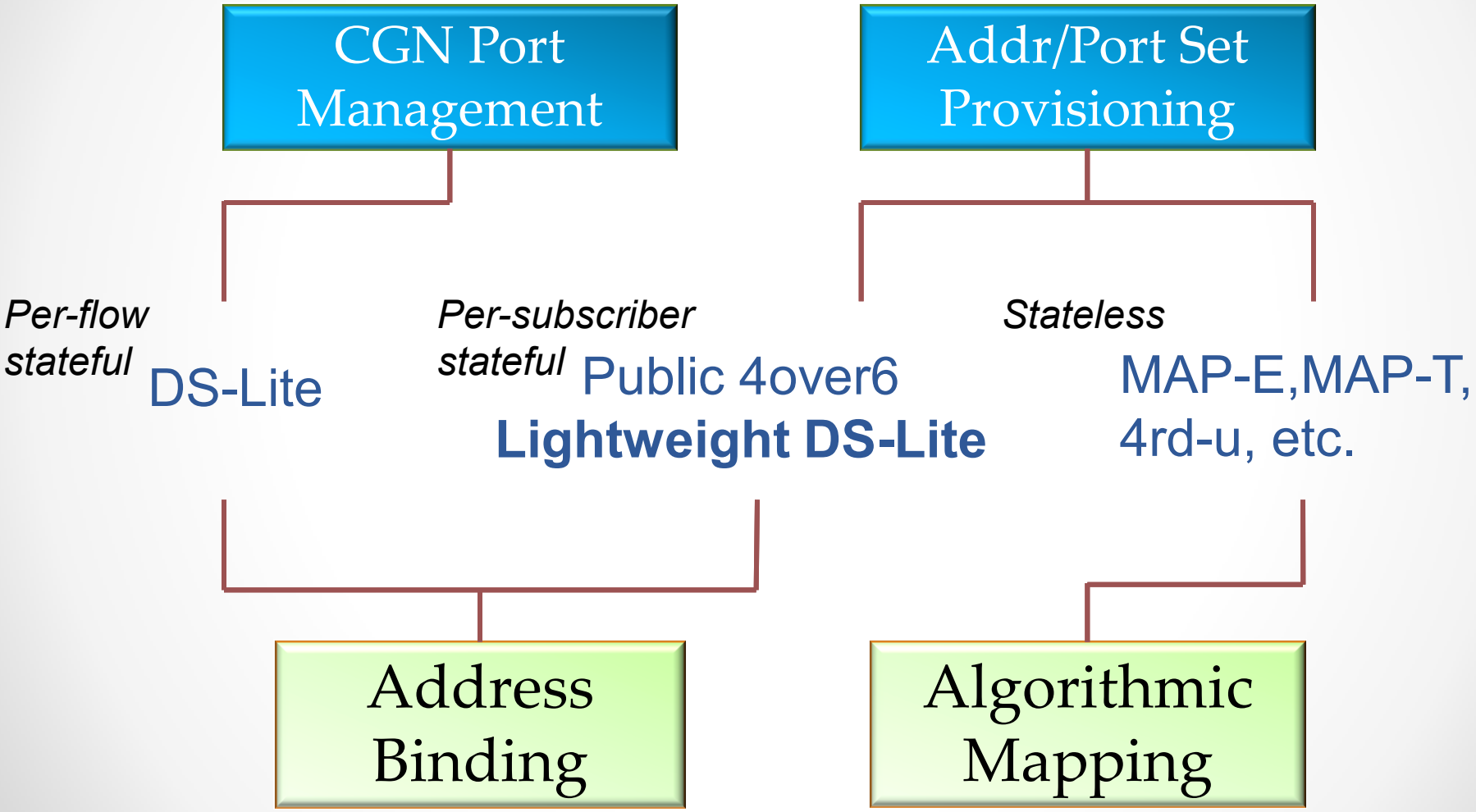
(Softwire item, presented here for feedback)

Motivations

- Simple extension to DS-Lite to push NAT function to CPE
- Eliminate per-flow state on AFTR
- Eliminate per-flow logs on AFTR

- Hub & Spoke model:
  No mathematical IPv4 and IPv6 address coupling

Technical Matrix



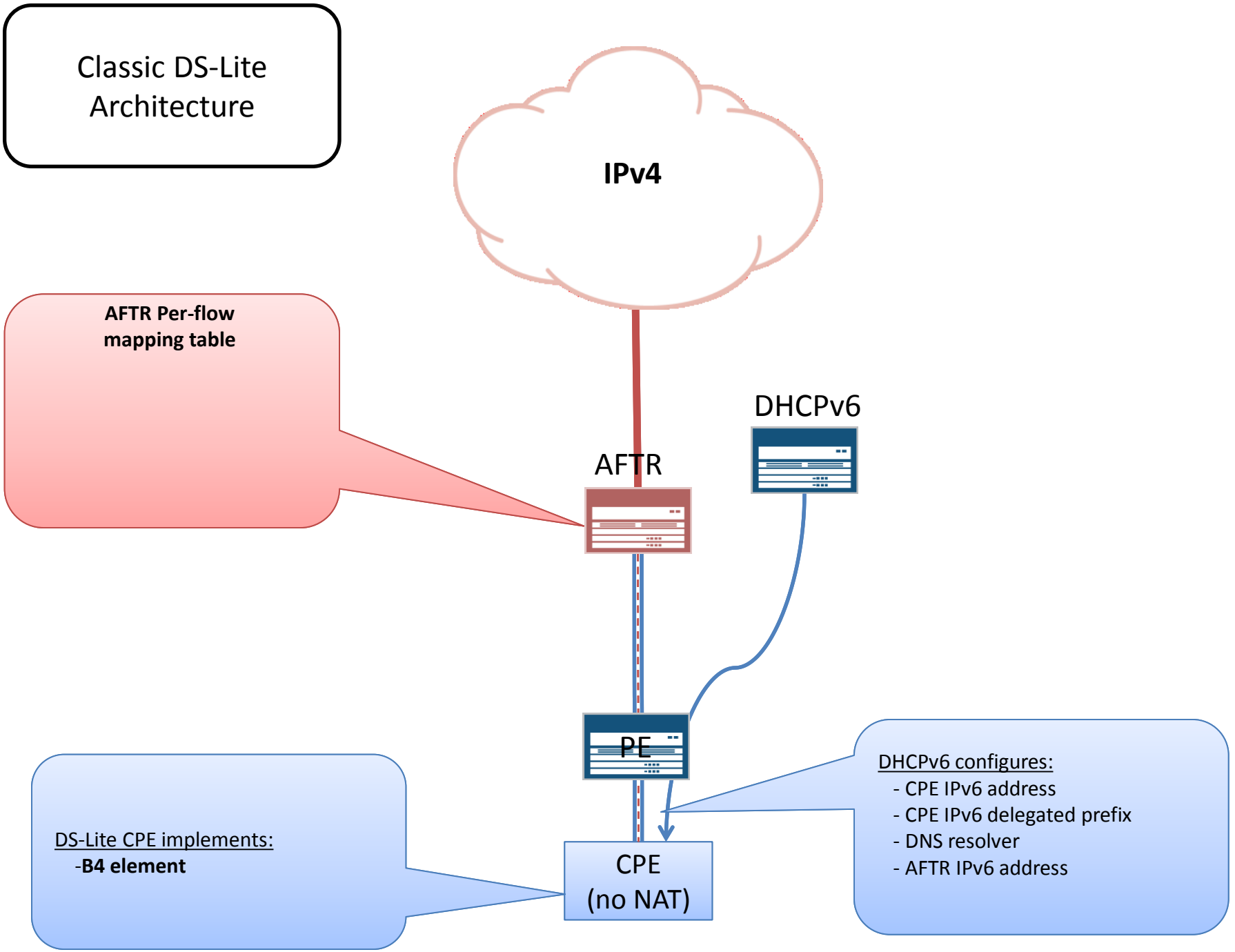
Benefits of allocating independently IPv6 and IPv4 address

- IPv6 addresses do not have to be allocated sequentially.
- Easily define and change IPv4 customer profiles (number of ports).
- IPv4 resources can be re-allocated freely.

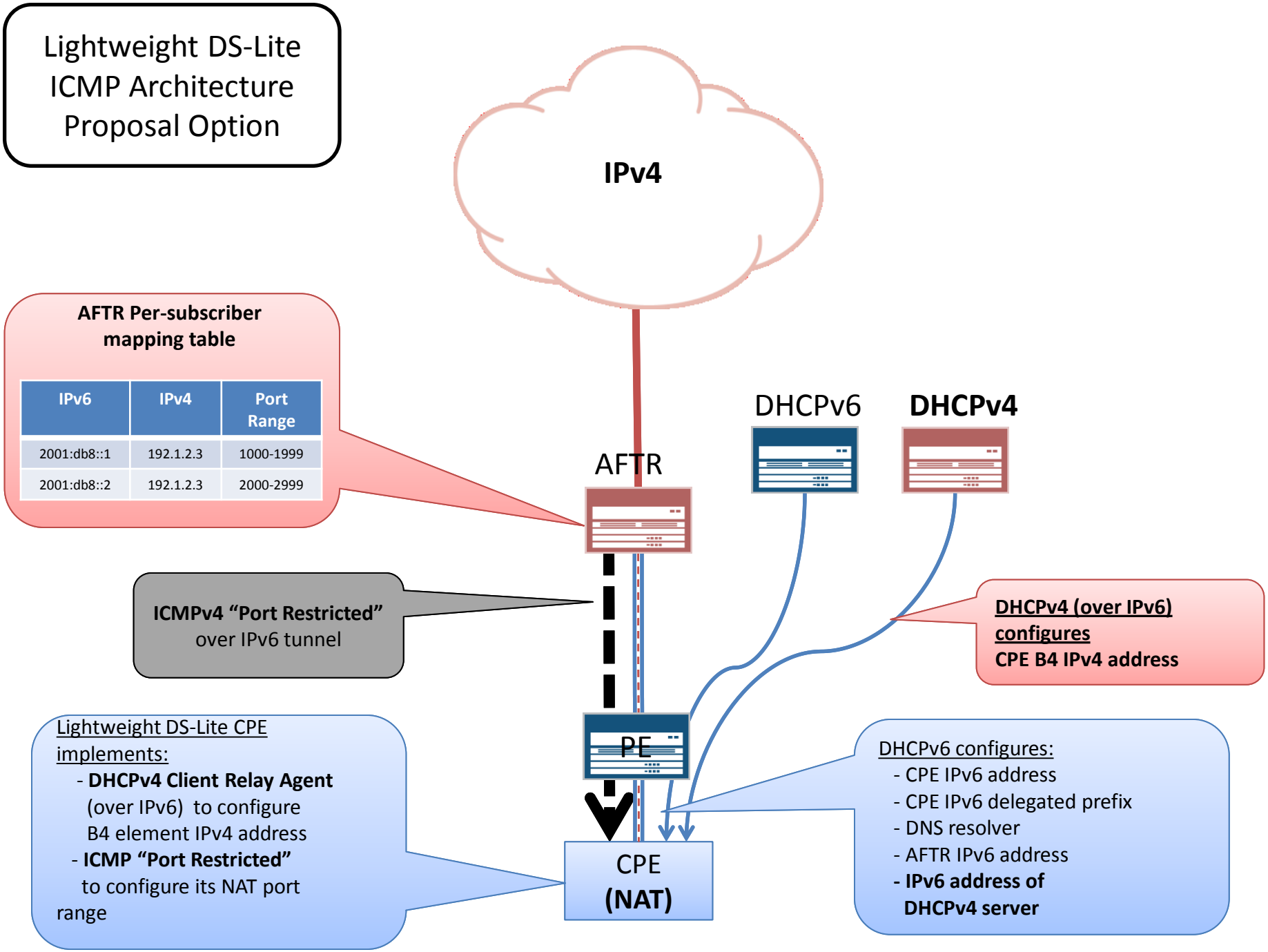
Not Tying IPv6 address to IPv4 address plus port range

- In general, removing the mathematical restriction allows the operator to deliver the service he wants to offer, in the way he wants to offer them.
- The price to pay is to provision and manage resources at a finer granularity.
- Introduce per-subscriber state on tunnel concentrator (AFTR)
  - No per flow state!

Classic DS-Lite Architecture



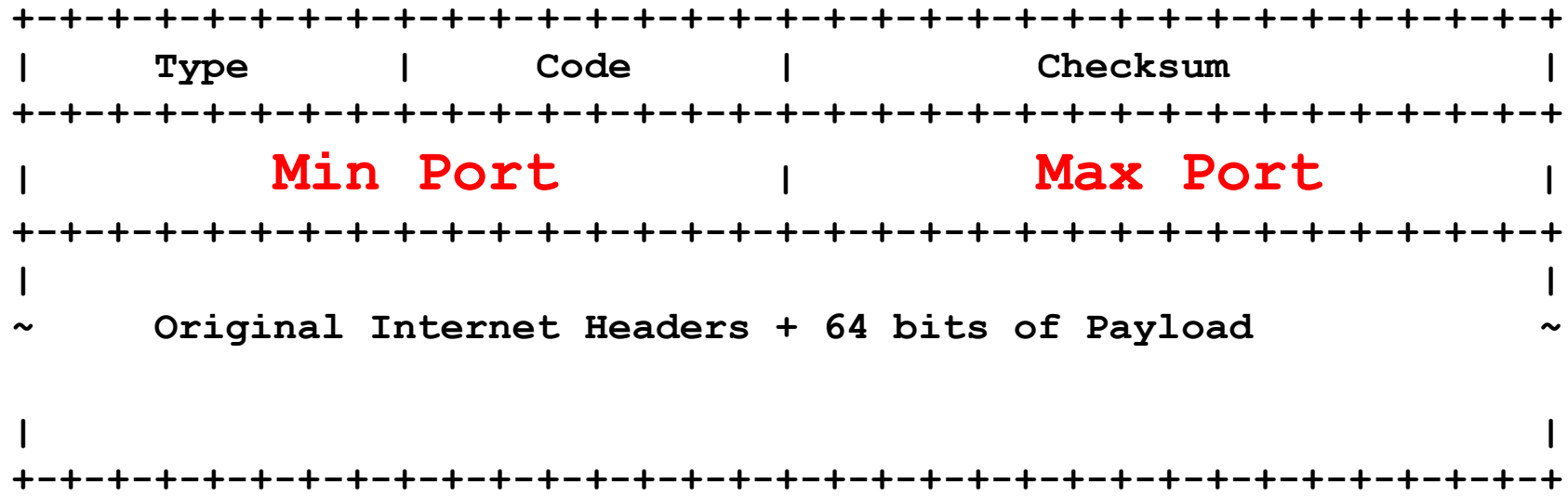
Lightweight DS-Lite ICMP Architecture Proposal Option



ICMP port restricted message as proposed method to communicate port restricted range

- Under discussion in Softwire
  - AFTR must notify the CPE when port is out of assigned range with an ICMP message
  - Can we re-use existing ICMP message:
    - Port exceeded
    - Administratively prohibited
    - Other?
  - Or do we need a new ICMP message?

Current proposal: IPv4 ICMP Packet Format

- 

Security Considerations

- Require ingress filtering on IPv6 access network
- (MaxPort – MinPort) MUST be >= 64
- IPv6 SRC MUST be AFTR's IPv6 address
  - As configured on CPE (learned from DHCPv6)
- IPv6 DST MUST be CPE's IPv6 adddress
- IPv4 SRC MUST be 192.0.0.1
  - AFTR well known address
- IPv4 DST MUST be CPE's IPv4 address