

Lightweight 4over6  
+  
SD-nat (aka stateless DS-Lite)  
=  
Lightweight DS-Lite  
(twice as light!)

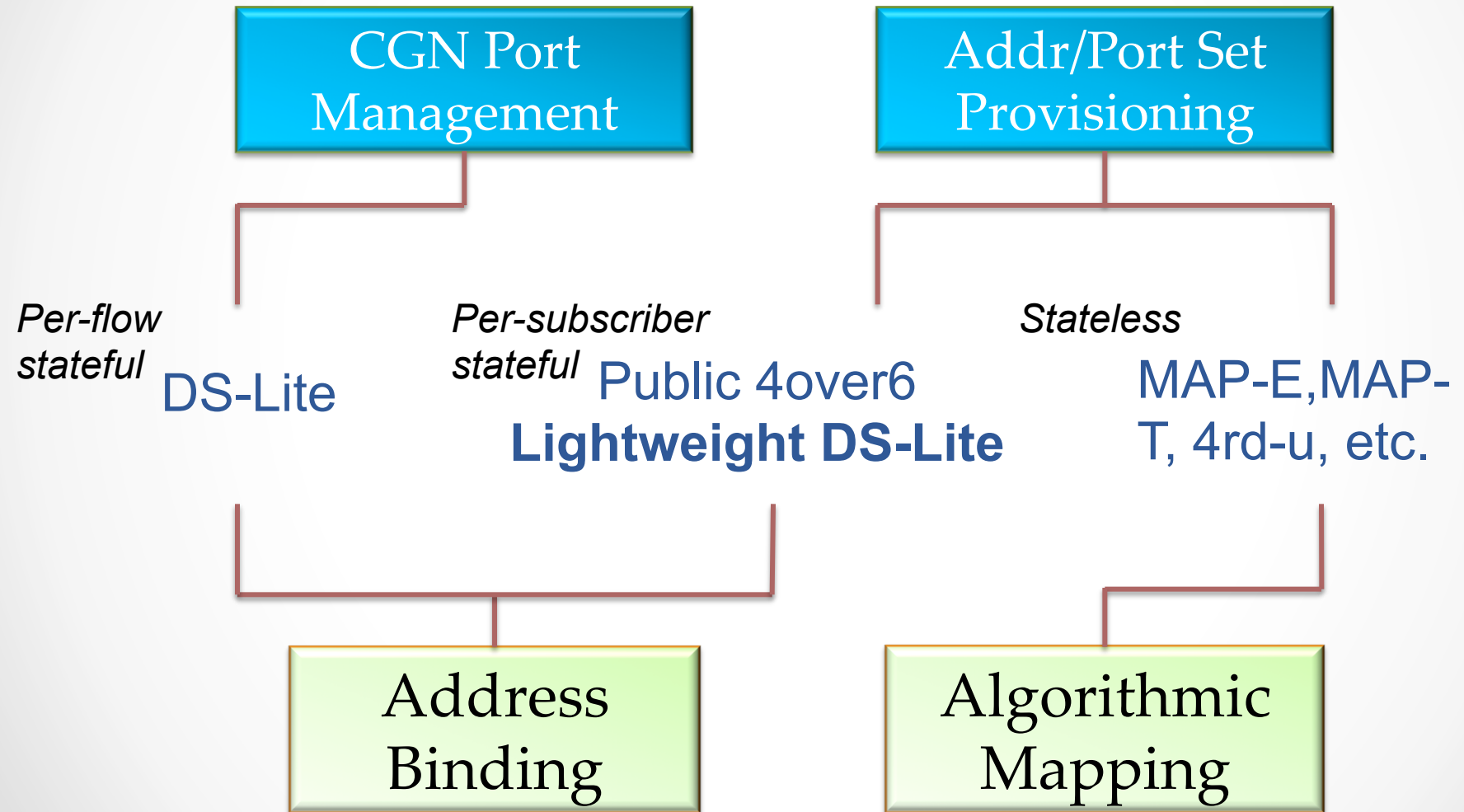
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(Softwire item, presented here for feedback)

# 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



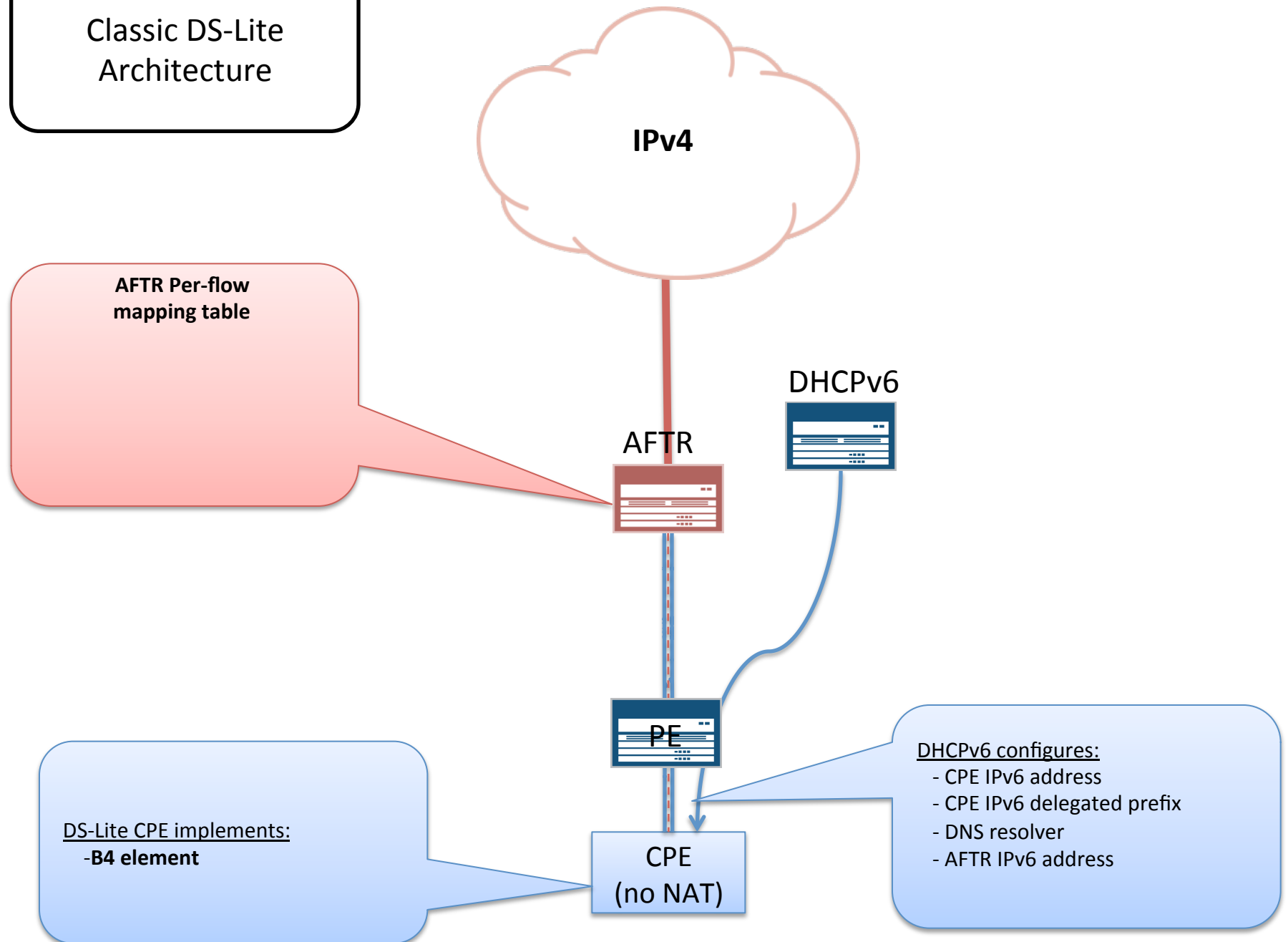
# Benefits of allocating independently IPv6 and IPv4 address

- 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.

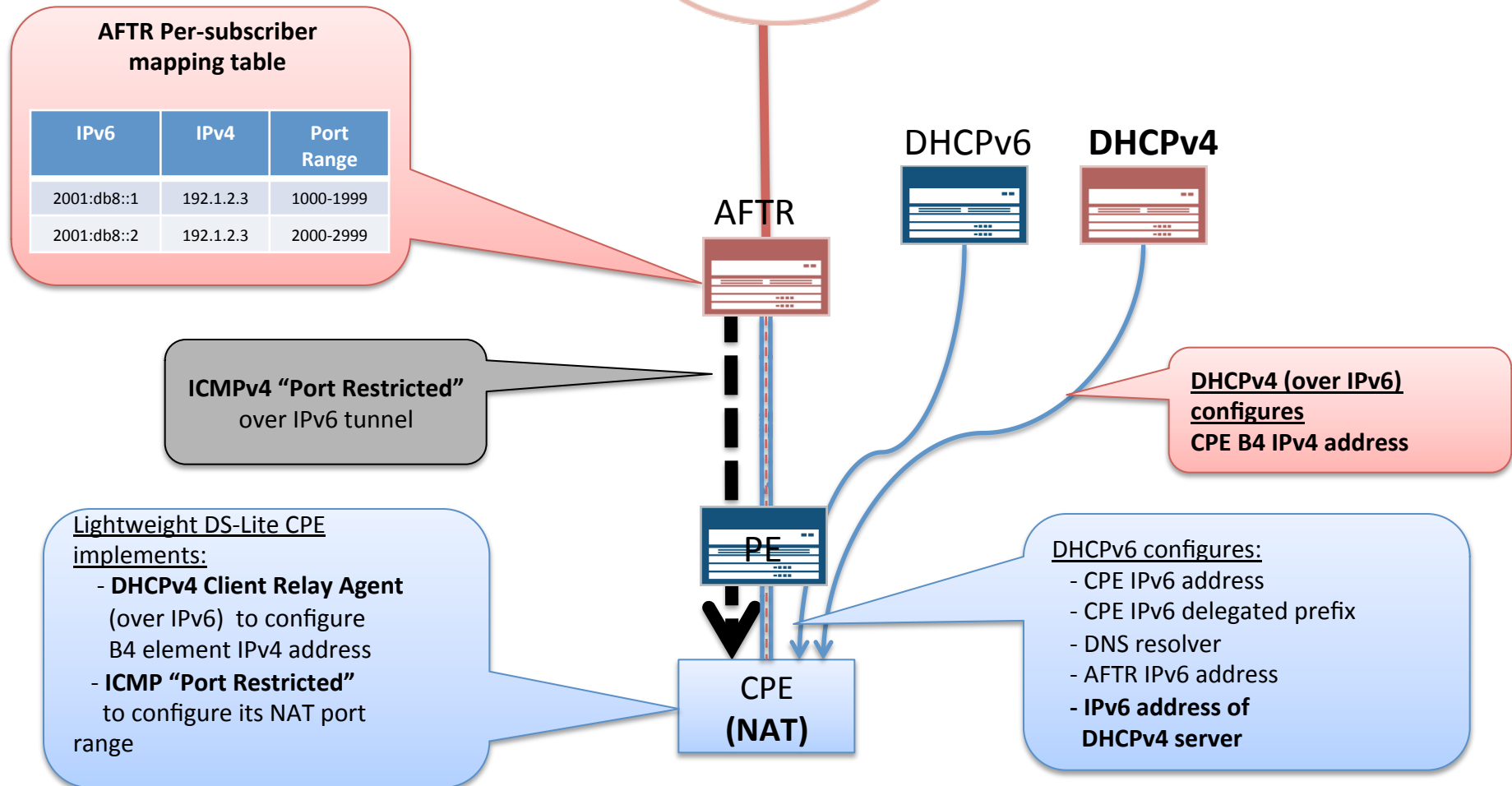
# Not Tying IPv6 address to IPv4 address plus port range

- 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

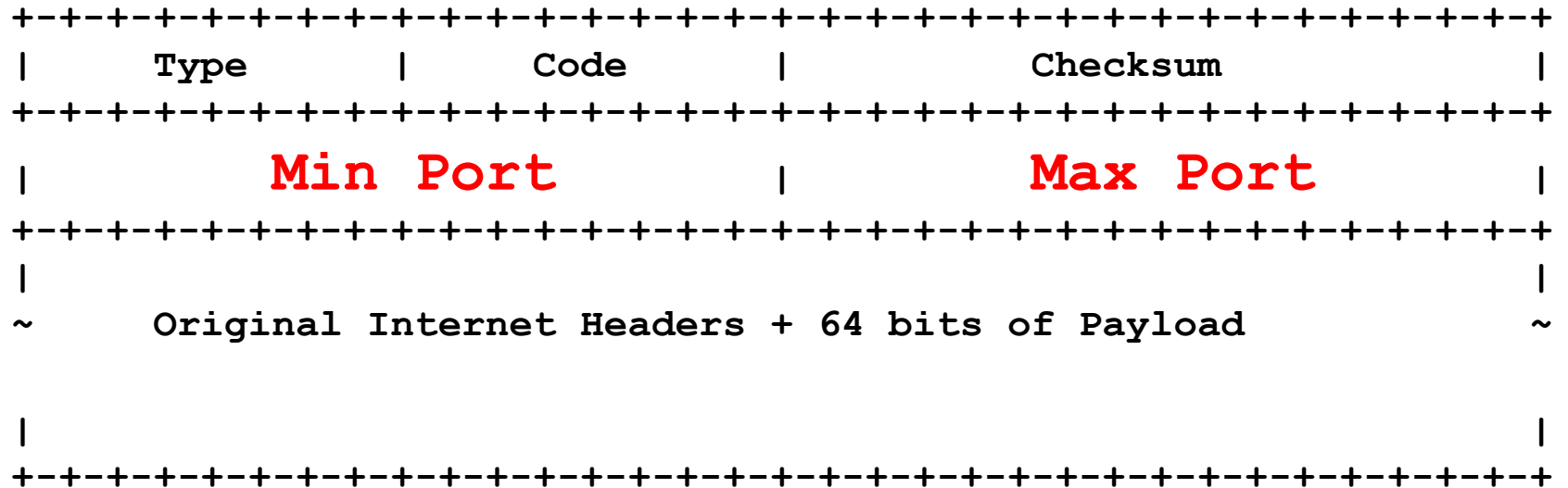


# ICMP port restricted message as proposed method to communicate port restricted range

- Under discussion in Softwire
  - AFTR must notify the CPE when port is out of assigned range
  - Need a new ICMP message type for that
  - **Just use it to carry correct port range information!**
  - **Precedent to use ICMP to carry information to host: pMTUd: ICMP packet too big**



# IPv4 ICMP Packet Format



# Security Considerations

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