Deploying Dual-Stack Lite in IPv6-Only Network

draft-boucadair-dslite-interco-v4v6-04

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The Motivation…

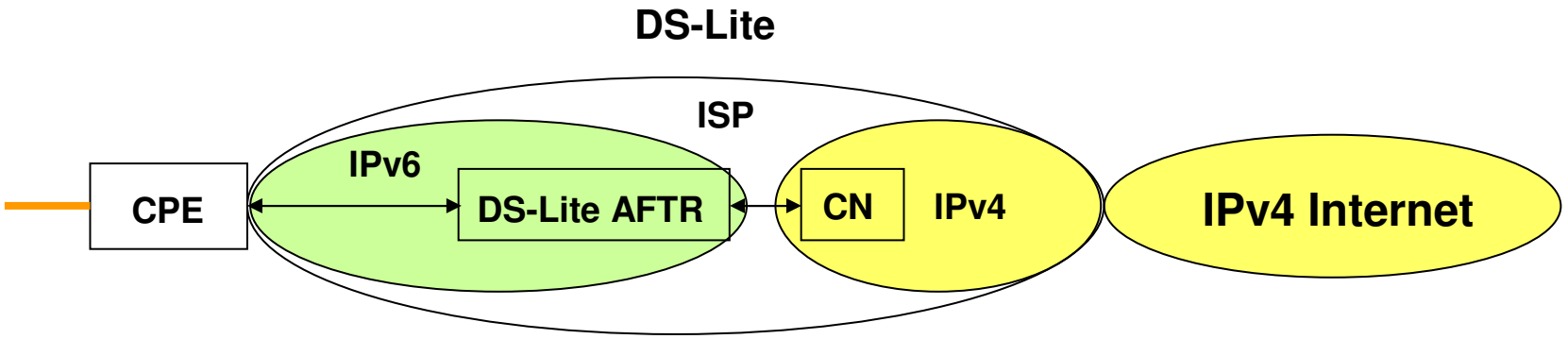
- **Many deployment models prefer to deploy AFTRs closer to the customers for many reasons (shorter the tunnel, etc).**

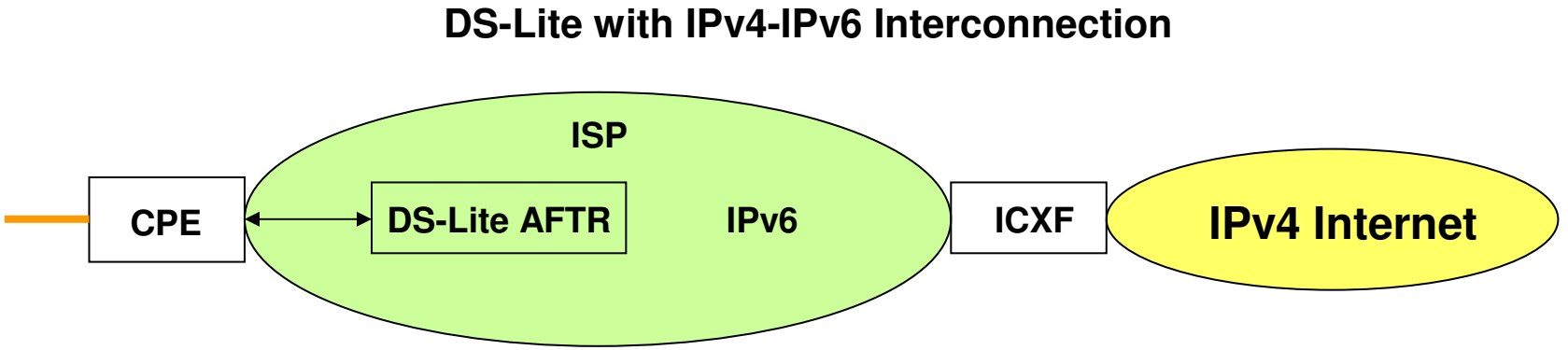
- **DS-lite requires the AFTR must have IPv4 connection. If the AFTR is close to the users, it puts an restriction to deploy IPv6-only core network.**

- **This draft proposes a solution by introducing a stateless IPv4-IPv6 interconnection function**
  - The solution can be seen as an extension to DS-Lite
  - This solution encourages the deployment of IPv6 while offering both IPv4 and IPv6 connectivity services over an IPv6 network

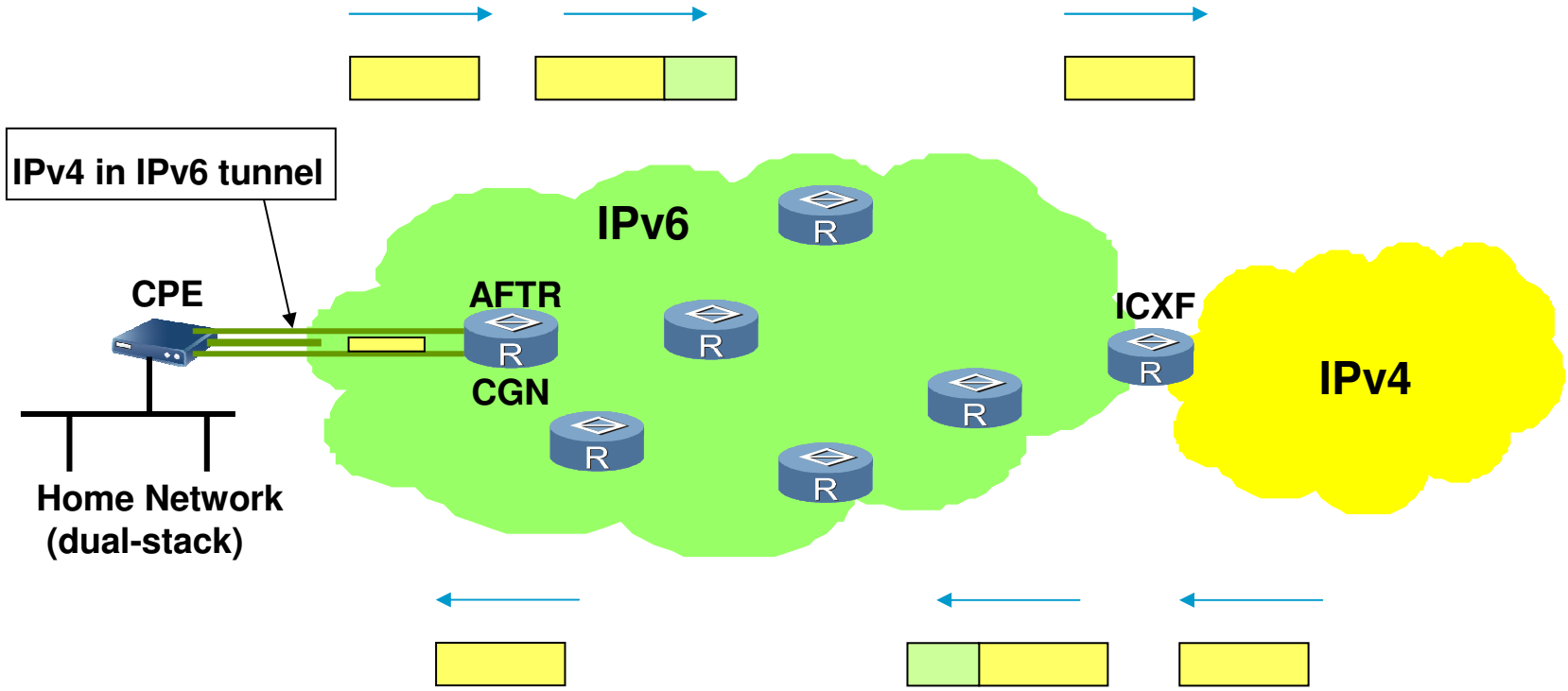
- **With the proposed IPv4-IPv6 interconnection in DS-Lite environment, the operation would be more robust and scalable**

DS-Lite in IPv6 Network





Transporting IPv4 Packets over IPv6 Network



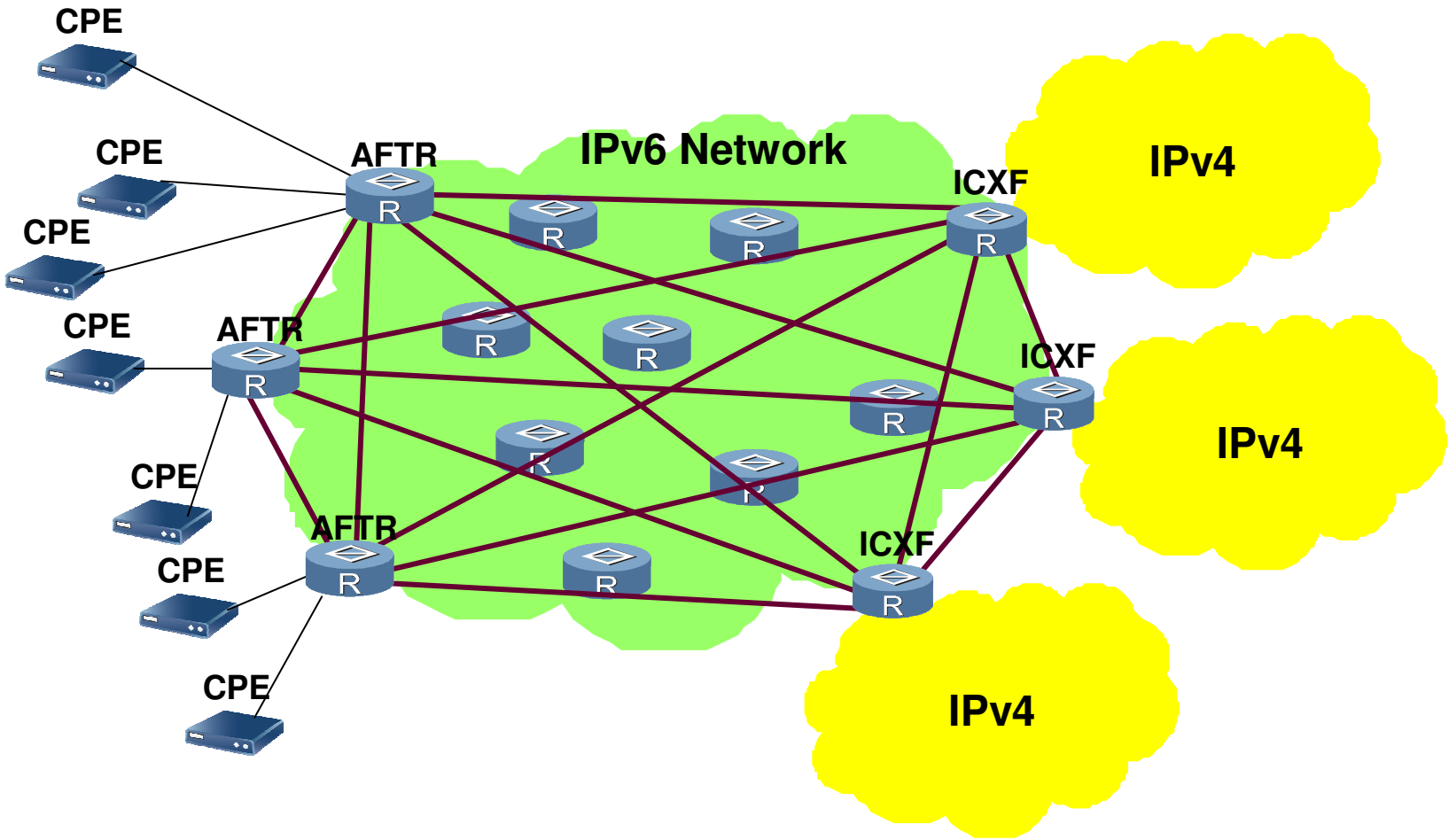
Addressing…

- **Pref6**
  - **An IPv6 prefix assigned by LIR.**
  - **The same Pref6 should be configured on each AFTR and ICXF.**
  - **The Pref6 is used as a IPv6 prefix to form an IPv4-Embedded IPv6 address**
    - **Reference: http://tools.ietf.org/html/draft-ietf-behave-address-format-04.txt**
- **Encapsulating an IPv4 packet with an IPv6 header on an AFTR**
  - **Source IPv6 address: AFTR's own IPv6 address**
  - **Destination IPv6 address – IPv4-Embedded IPv6 address**
    - **Pref6 + The IPv4 address is the destination IPv4 address**
- **Encapsulating an IPv4 packet with an IPv6 header on an ICXF router**
  - **Source IPv6 address: ICXF's IPv6 address**
  - **Destination IPv6 address – IPv4-Embedded IPv6 address**
    - **Pref6 + The IPv4 address is the destination IPv4 address**

Routing Options in the IPv6 network

- **How to route IPv4-Embedded IPv6 packets in the IPv6 network?**
- **There are several options including:**
  - **Static configuration on AFTR and ICXF, respectively**
  - **ICXF routers and AFTRs are configured as a softwire mesh (RFC5565) with i-BGP used to exchange IPv4 reachability information**
  - **ICXF routers and AFTRs advertise IPv4-Embedded IPv6 addresses and prefixes in the IPv6 network vis IGP**
- **Routing policy remains ISP-specific, and is likely to depend on the network topology, the location and number of AFTR and ICXF functions, as well as scalability considerations**

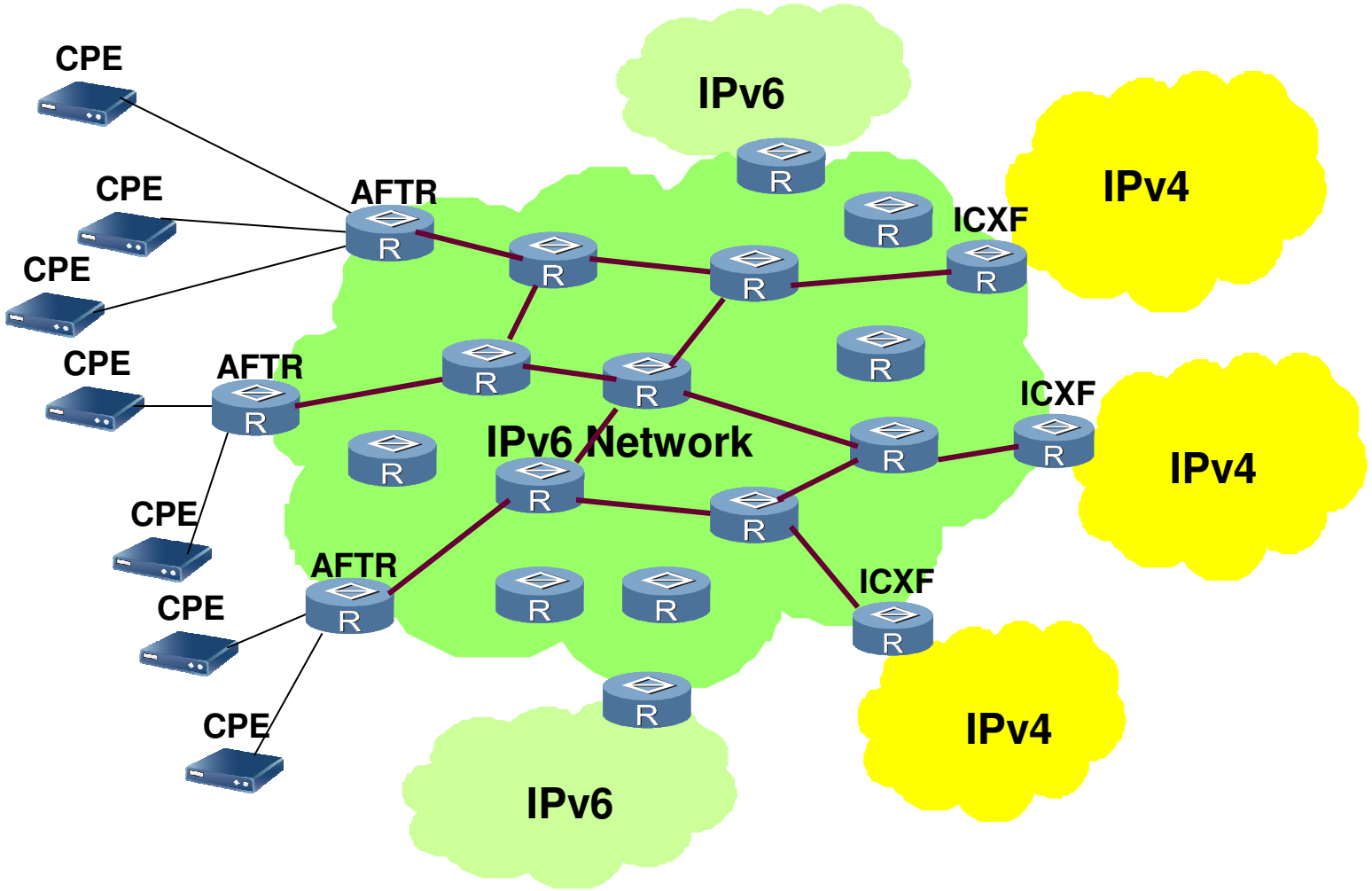
Softwire Mesh (RFC5565)



AFTRs and ICXFs exchange IPv4 reachability using i-BGP

(The full-mesh requirement can be relaxed by using Route-Reflector)

MT/MI for IPv4-Embedded IPv6



AFTR and ICXF advertise IPv4-Embedded IPv6 Reachability

(This IPv4-Embedded IPv6 prefixes will not advertised outside the ISP)

Changes from 02

- **Added a new section to define addressing scheme**
- **Added a new section to list some routing options in IPv6 network for forwarding IPv4-Embedded IPv6 traffic**
- **Various editorial changes**

Next Step …

- **Authors would like to propose to move this I-D as a Working Group document**