# 4map6 Segments for IPv4 Service delivery over IPv6-only underlay networks

## draft-dong-spring-sr-4map6-segments-00


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# Overview

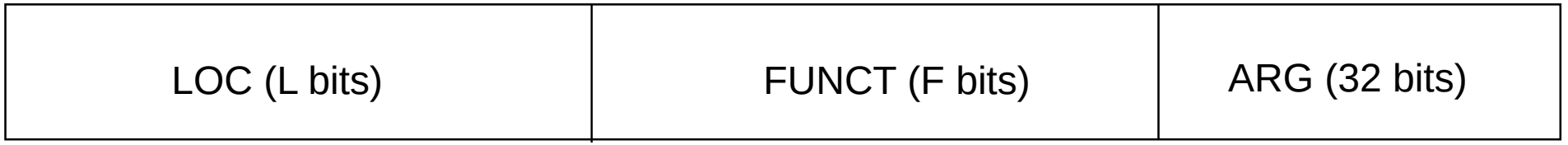
- [draft-ietf-v6ops-framework-md-ipv6only-underlay] proposes a framework, in which IPv4 packets will be stateless translated or encapsulated into IPv6 ones for transmission across multi-domain IPv6-only underlay.
- This document defines two new types of segments for Segment Routing, i.e., M46S and M46D segments, which are mapping rules based IPv4/IPv6 conversion function running in PE nodes.

# Why the 4map6 Segments is needed?

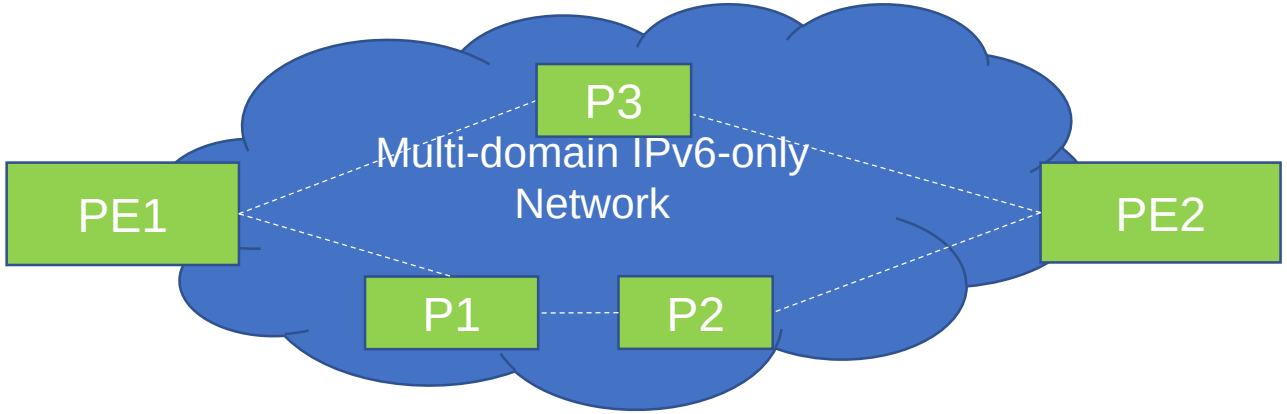
- [draft-ietf-v6ops-framework-md-ipv6only-underlay] proposes a framework for deploying IPv6-only as the underlay in multi-domain networks. In this framework, each PE will be identified by at least one IPv6 mapping prefix, it will also have one or more associated IPv4 address blocks which are extracted from local IPv4 routing table or address pool.
- A specific data structure called address mapping rule is defined to express the mapping relationship between IPv4 address blocks and the IPv6 mapping prefix of the remote PE.
- If the mapping rules of the remote PE are obtained by the ingress PE, the mapping rule will give the forwarding guidance of IPv4 packet delivery in the IPv6-only network when the destination address of the IPv4 packet matches its IPv4 address block,

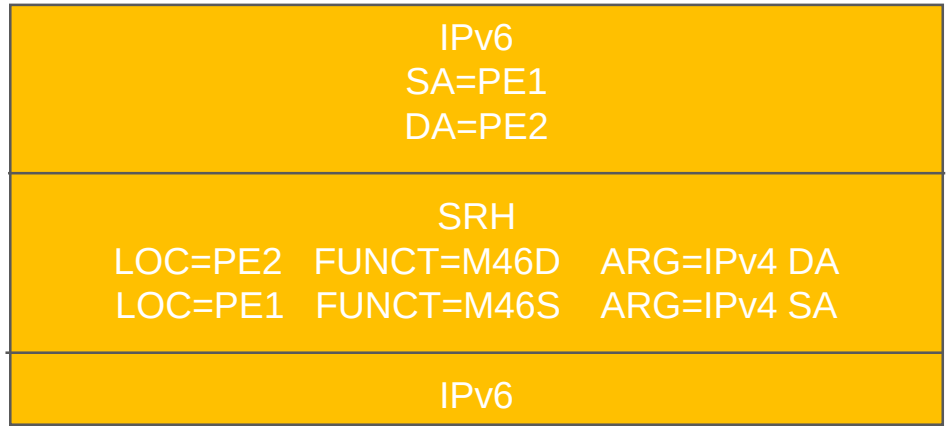
# 4map6 SIDs architecture

- As new types of SID, M46S and M46D segments will follow the format of a general SID. Furthermore, several information items specific to stateless address mapping and packet conversion are carried in the relevant fields of the M46S SID and M46D SID,
  - The LOC field is a prefix allocated by operators to identify the node which instantiates the M46S/M46D SID.
  - The FUNCT field identifies the behavior bound to the M46S/M46D SID.
  - The ARG field contains the IPv4 address prefix associated with the PE node. Since the IPv4 address prefix requires a maximum of 32 bits of a SID, the value of L+F should be less than or equal to 96.



# IPv6 packet delivery process carrying M46D and M46S SIDs



# Advertising 4map6 SIDs

- In an SRv6 network environment, the M46S/M46D SID needs to be advertised. The node advertises the M46S/M46D SID, B:N:FUNCT:ARG, through the control plane together with the SRv6 Endpoint Behavior codepoint identifying the behavior of the SID.
- Similar to other types of SIDs, the M46S/M46D SID can be distributed within and across domains via IGP and BGP or other approaches.
- The distribution of the M46S/M46D Endpoint Behavior codepoint is left in future documents, e.g. by extending the SRv6 L3 Service TLV as defined in [RFC9252].

# Next Steps

- Welcome more comments and discussion

Thank you !