

MP-BGP Extension and the Procedures for IPv4/IPv6 Mapping Advertisement

draft-xie-idr-mpbgp-extension-4map6

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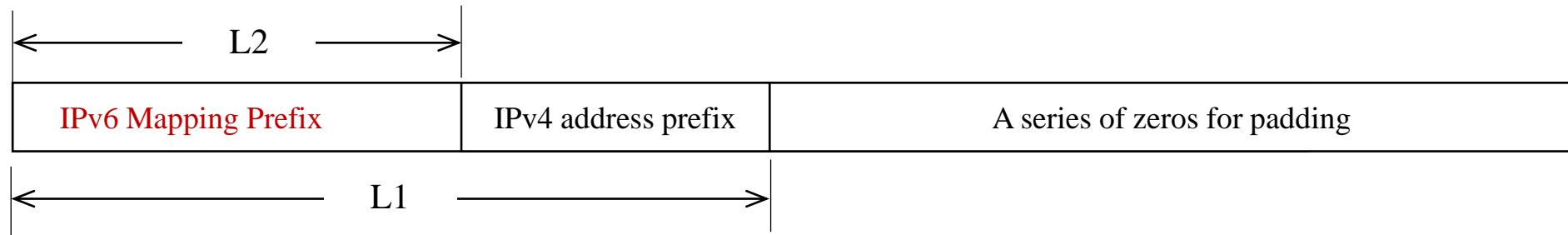
idr@IETF 118, November 2023

Context

- This document focuses on IPv6-only deployment for multi-domain networks managed by a single and multiple operators.
- [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.
- It defines MP-BGP extension and the procedures for IPv4 service delivery in multi-domain IPv6-only underlay networks.
- It was proposed in Jan. 2023, presented in IETF 116, 117, the current version is - 07.

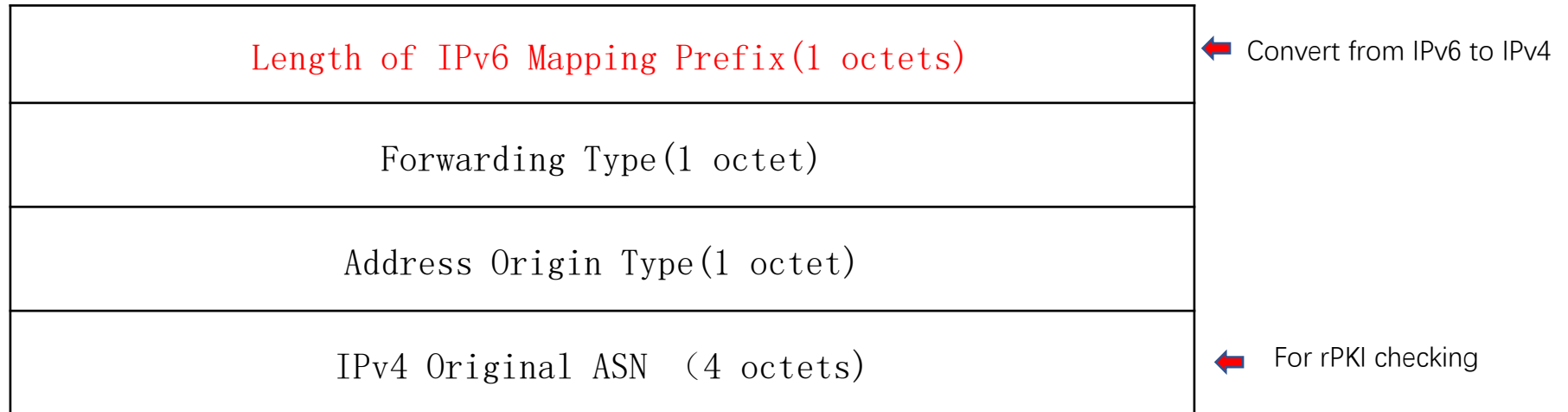
MP_REACH_NLRI

- The existing AFI/SAFI combination is used to identify the reachability of IPv4 address block in IPv6-only networks.
 - AFI = 2 (IPv6)
 - SAFI = 1 (Unicast)
 - Length of Next Hop
 - Network Address of Next Hop
 - NLRI : Composite IPv6 address prefix, which is composed of a **IPv6 mapping prefix**, the **original IPv4 address prefix**, and a series of padding bits



4map6 BGP path attribute

- It specifies the IPv6 mapping prefix and other additional information needed to properly transform the IPv4 packets. It is optional and transitive.
- ATTR_SET attribute of RFC6368 can also be used to transfer the BGP routing information of the IPv4 in IPv6-only networks, including IPv4 ASN,



Revisions made since IETF 117

- For the scope of this attribute, the following sentences is added in section 2,
 - "Although network diagram above contains only several autonomous systems, the approach in this document can be applied not only to the case of closed network(i.e. Walled Garden), but also to that of open Internet, as long as the network devices in the autonomous systems support the functions defined in this document. “
- The following sentences are added to the security consideration sections,
 - “...the new mechanism supports the translation of IPv4 to IPv6 and back to IPv4, the packets may go around some filtering that exists in their original network. To address this issue, it is recommended to configure corresponding filtering in IPv6-only networks to handle packets converted from IPv4 packets.”

Revisions made since IETF 117

- Text about calculation of the distance metric is added,
 - “ ‘Distance metric’ refers to the distance from ingress PE to egress PE in IPv6-only network for IPv4 service delivery. This metric is associated with a specific IPv4 address block, when a IPv6 node receives a BGP advertisement about the route of the given IPv4 address block, it can locally calculate the distance metric for the egress PE by counting the number of DISTINCT ASes in the AS_Path attribute. Generally distance metric is used for egress PE selection when there are multiple egress PEs for a given IPv4 address block. ”
- Others,
 - The number of main authors has been reduced to 5.
 - Several nits have been fixed.

Thanks

- We express our sincere thanks to Robert Raszuk, Cheng Li, Jingrong Xie, Gyan Mishra, Eduard Metz, Shuping Peng, Weiqiang Cheng, Changwang Lin, Yingzhen Qu, Qin Wu, shunwan Zhuang, Di Ma, Paolo Volpato, Aijun Wang, Susan Hares, Jeffrey Haas etc, for the comments and suggestions.

Next Steps

- Comments and suggestions are welcome, and make further refinement to improve the document.

Thank you !
Q&A