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IPv4-mapped IPv6 Instance IDs in IS-IS
draft-boucadair-isis-v4v6-mi-01

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Abstract

This memo defines two new Instance Identifiers (Instance IDs) in IS-IS [[RFC1195](#)]). These new Instance IDs [[I-D.ietf-isis-mi](#)] are meant to instantiate distinct IS-IS instances to convey routing information which is restricted to IPv4-mapped IPv6 addresses [[I-D.ietf-behave-address-format](#)]. The ultimate goal of running separate instances for IPv4-mapped IPv6 routes is to isolate the IPv6 routing table from the IPv4 routing table, and to avoid any overload due to the population of the table by IPv4-mapped IPv6 routes. This isolation is motivated also from an operational perspective to allow the enforcement of specific routing policies for each topology.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

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1. Introduction

[I-D.ietf-isis-mi] specifies a mechanism to map each address family to a separate IS-IS [[RFC1195](#)] Instance identified by an ID. Accepted ID values are 0 to 65535. Instance ID#0 is used by default (legacy systems). This document requests the assignment of two new MI-IS-IS Instance IDs for the following usages:

- o Unicast IPv4-mapped IPv6 IS-IS routing instance;
- o Multicast IPv4-mapped IPv6 IS-IS routing instance.

Within the double context of IPv4 address exhaustion and the IPv6-IPv4 interconnection, numerous solutions are being elaborated within IETF. Both translation (e.g., [[I-D.ietf-behave-v6v4-xlate-stateful](#)] and [[I-D.ietf-behave-v6v4-xlate](#)]) and encapsulation (e.g., [[I-D.boucadair-dslite-interco-v4v6](#)] and [[I-D.boucadair-behave-ipv6-portrange](#)]) schemes are proposed to facilitate IPv6-IPv4 interconnection. These solutions require the injection of routes to IPv4-mapped IPv6 [[I-D.ietf-behave-address-format](#)] destination prefixes in intra-domain routing protocols. In order to prevent any overload of the native IPv6 routing table with IPv4-mapped IPv6 routes, this memo defines new Instance IDs which are required for the activation of several IS-IS instances for unicast/multicast IPv4-mapped IPv6. Such new instances are also meant to facilitate the operation of networks that convey IPv4 and IPv6 traffic and to ease the migration to full IPv6. As a result, when a separate IS-IS instance for unicast IPv4-mapped IPv6 address family is activated, a distinct IS-IS adjacency table is

created, based on which unicast IPv4-mapped IPv6 routes is computed. Likewise, when a separate IS-IS instance for multicast IPv4-mapped IPv6 address family is activated, a distinct IS-IS adjacency table is created for multicast IPv4-mapped IPv6 route computation purposes.

In case [[RFC5120](#)] is deployed, new Multi Topology IDs are required to be defined. As a reminder, [[RFC5120](#)] specifies a mechanism to maintain multiple IS-IS topologies within the same IS-IS domain. This memo does not make any preference between the solution described in [[RFC5120](#)] and [[I-D.ietf-isis-mi](#)]. Network administrators have to make their decisions based on local policies and preferences. If the multi-instance mechanism [[I-D.ietf-isis-mi](#)] is deployed in an IS-IS network as a preference for multiple topologies, the extensions as defined in this memo may be used to support unicast/multicast IPv4-mapped IPv6 routing, respectively.

[2.](#) Procedure

This document does not require any modification to the procedure specified in [[I-D.ietf-isis-mi](#)]. Nevertheless, only routes to IPv4-mapped IPv6 prefixes MUST be instantiated within a IPv4-mapped IPv6 routing M-ISIS. Concretely, the IANA prefix defined in [[I-D.ietf-behave-address-format](#)] MUST be supported by default. Service providers MAY also choose a LIR prefix to build the IPv4-mapped IPv6 addresses.

[3.](#) Forwarding

Only incoming datagrams destined to IPv4-mapped IPv6 addresses are associated (and therefore are forwarded) with the IPv4-mapped IPv6 unicast/multicast IS-IS Instance, respectively. WKP and/or LIR prefix defined in [[I-D.ietf-behave-address-format](#)] MUST be configured in all participating nodes.

[4.](#) IANA Considerations

This document requests the following IS-IS Instance IDs:

- o Instance ID# for IPv4-mapped IPv6 unicast AF;
- o Instance ID# for multicast IPv4-mapped IPv6 AF.

[5.](#) Security Considerations

This document does not introduce any security issue in addition to those defined in [[I-D.ietf-isis-mi](#)].

[6.](#) Acknowledgements

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[7.](#) References

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