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Dynamic Allocation Guidelines for Network Prefix-based IPv6 Multicast Addresses

Status of this Memo

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Abstract

With the current multicast address architecture and the proposed multicast address architecture, a set of guidelines is needed for multicast address allocation servers to use in assigning IPv6 multicast addresses. The purpose of these rules is to reduce the possibility of address collision not only at layer 3, but also on devices at layer 2.

1. Terminology

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](#)].

2. Introduction

With the current multicast address architecture [[RFC 2373](#)] and the

multicast address architecture proposed in [NEW ARCH], a set of guidelines is needed for multicast address allocation servers [MALLOC] to use in assigning IPv6 multicast addresses. The purpose of these rules is to reduce the possibility of address collision not only at layer 3, but also on devices at layer 2.

These guidelines specify how the lowest 32 bits of the IPv6 multicast address are chosen and assigned. The guidelines specify several mechanisms that can be used to determine the lowest 32 bits of the

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multicast address. By having several mechanisms of varying complexity, implementers and operators have the flexibility to choose a mechanism that is appropriate for their application.

[3.](#) Assignment of New IPv6 Multicast Addresses

The current approach [RFC 2464] to map IPv6 multicast addresses into IEEE 802 MAC addresses takes the low order 32 bits of the IPv6 multicast address and uses it to create a MAC address. Group ID's less than or equal to 32 bits long will generate unique MAC addresses.

The goal of this document is to present several mechanisms implementers and operators can use to select the group ID portion of the address so that the possibility of collisions at the IP layer and at the IEEE 802 layer is reduced. The following section presents several different mechanism of varying complexity that can be used to select an appropriate group ID.

[4.](#) Group ID Selection Guidelines

The following guidelines assume that the upper 96 bits of the IPv6 multicast address have been set up. For unicast network prefix-based multicast addresses, the set up of those bits is done in the following manner:

- o An IPv6 multicast address prefix is initialized with the appropriate flags and scope fields
- o The IPv6 Network Prefix is inserted into the address and the plen field is set. The Network Prefix is obtained from the periodic Router Advertisements.
- o The reserved field in the IPv6 multicast address is set to zero

With the multicast address architecture in [[RFC 2373](#)], the set up of those bits is done in the following manner:

- o An IPv6 multicast address prefix is initialized with the appropriate flags and scope fields
- o The reserved field in the IPv6 multicast address is set to zero

The group ID portion of the address is set using either a pseudo-random 32-bit number or a 32-bit number created using the guidelines in [RFC 1750]. Possible approaches to creating a pseudo-random number are to use an MD5 message-digest [[RFC 1321](#)] or portions of an NTP [[RFC 1305](#)] timestamp.

Requests for more than one multicast address SHOULD be handled atomically. One possible approach is to use the initial group ID, created using the guidelines above, as the base address in a contiguous block of multicast addresses. Another approach is to create multiple group IDs and generate the appropriate multicast addresses.

[5.](#) Security Considerations

This document does not have any direct impact on Internet infrastructure security.

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[6.](#) References

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