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Static Allocation of Multicast Addresses in the Internet Protocol Version 6 (IPv6)

<draft-haberman-malloc-static-ipv6-alloc-00.txt>

Status of This Memo

Abstract

This document defines a mechanism for statically allocating IPv6 multicast addresses by network prefixes. This approach will integrate seamlessly with the Multicast Address Dynamic Client Allocation Protocol (MADCAP). It will also remove the need to support the Multicast Address Set Claim (MASC) Protocol for IPv6.

Contents

1. Keywords

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].

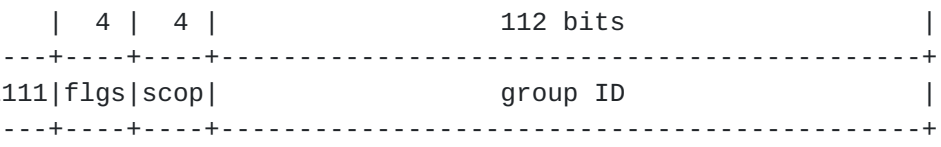
2. Introduction

One of the most common problems with IPv4 multicast is the limited size of the multicast address range. This limited range size has led to
several mechanisms for allocating IPv4 multicast addresses. With the address architecture introduced for IPv6 [ADDARCH], the address range constraint does
not hinder IPv6 multicast. Because of the increased address size, it is feasible to allocate multicast addresses statically in IPv6.

This work describes the mechanism for the static allocation of IPv6 multicast addresses based on the IPv6 network prefix. It will work seamlessly with the MADCAP [MADCAP]
protocol. Because this is a static allocation, it will eliminate the need for running the MASC protocol [MASC].

3. IPv6 Multicast Address Format

The IPv6 address architecture defines an IPv6 multicast address as follows :



The legal values for the flgs and scop field are defined in the IPv6 address architecture [ADDARCH].

4. Static Allocation

4.1. Globally routable prefixes

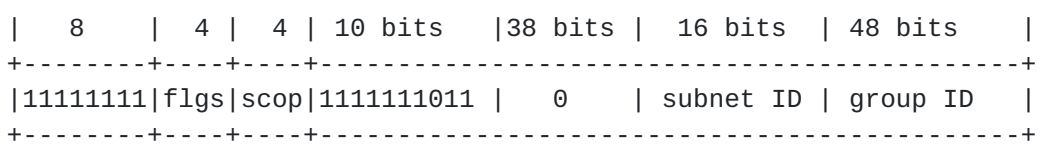
The mechanism for allocating IPv6 multicast addresses will be to imbed an IPv6 unciast network prefix
in the multicast address starting at bit 16. The resulting multicast address will have the following format if

the network prefix was taken from an address format that must contain an EUI-64 based interface identifier (Section 2.4 of [ADDARCH]).

This format will allow for 2^48 group IDs for each unique (scop, prefix) pair.

4.2. Site-local prefixes

If a node attempting to obtain an IPv6 multicast address does not have a globally routable network prefix, it can use a site-local address prefix in the same manner. In this case, the multicast address format will be :



With this format, the scop field of the address can be no greater than site-local (5), defined in Section 2.7 of [ADDARCH].

4.3. Link-local prefixes

If a node only has a link-local address, section 2.5.8 of [ADDARCH], it can only use a multicast address with a scop field no greater than link-local (2). For this case, the multicast address format is as follows :

5. Security Considerations

6. References

[RFC2119] S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels", RFC 2119, BCP14, March 1997.

[ADDARCH] R. Hinden and S. Deering, "IP Version 6 Addressing Architecture", RFC 2373, July 1998.

[MADCAP] B. Patel, M. Shah, and S. Hanna, "Multicast Address Dynamic Client Allocation Protocol (MADCAP)", draft-ietf-malloc-madcap-04.txt, February 1999.

[MASC] D. Estrin, R. Govindan, M. Handley, S. Kumar, P. Radoslavov, and D. Thaler, "The Multicast Address-Set Claim (MASC) Protocol", draft-ietf-malloc-masc-01.txt, August 1998.

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8. Full Copyright Statement