Network Working Group
Request for Comments: 3171
BCP: 51
Category: Best Current Practice

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August 2001

IANA Guidelines for IPv4 Multicast Address Assignments

Status of this Memo

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Abstract

This memo provides guidance for the Internet Assigned Numbers Authority (IANA) in assigning IPv4 multicast addresses.

1. Introduction

The Internet Assigned Numbers Authority (IANA) (www.iana.org) is charged with allocating parameter values for fields in protocols which have been designed, created or are maintained by the Internet Engineering Task Force (IETF). RFC 2780 [RFC2780] provides the IANA guidance in the assignment of parameters for fields in newly developed protocols. This memo expands on section 4.4.2 of RFC 2780 and attempts to codify existing IANA practice used in the assignment IPv4 multicast addresses.

The terms "Specification Required", "Expert Review", "IESG Approval", "IETF Consensus", and "Standards Action", are used in this memo to refer to the processes described in [RFC2434]. The keywords MUST, MUST NOT, MAY, OPTIONAL, REQUIRED, RECOMMENDED, SHALL, SHALL NOT, SHOULD, SHOULD NOT are to be interpreted as defined in RFC 2119 [RFC2119].

In general, due to the relatively small size of the IPv4 multicast addresses space, further assignment of IPv4 multicast address space is recommended only in limited circumstances. Specifically, the IANA should only assign addresses in those cases where the dynamic selection (SDP/SAP), GLOP, SSM or Administratively Scoped address spaces cannot be used. The guidelines described below are reflected in http://www.iana.org/numbers.html.

2. Definition of Current Assignment Practice

Unlike IPv4 unicast address assignment, where blocks of addresses are delegated to regional registries, IPv4 multicast addresses are assigned directly by the IANA. Current assignments appear as follows [IANA]:

224.0.0.0	- 224.0.0.255	(224.0.0/24)	Local Network Control Block
224.0.1.0	- 224.0.1.255	(224.0.1/24)	Internetwork Control Block
224.0.2.0	- 224.0.255.0		AD-HOC Block
224.1.0.0	- 224.1.255.255	(224.1/16)	ST Multicast Groups
224.2.0.0	- 224.2.255.255	(224.2/16)	SDP/SAP Block
224.252.0.0	- 224.255.255.255		DIS Transient Block
225.0.0.0	- 231.255.255.255		RESERVED
232.0.0.0	- 232.255.255.255	(232/8)	Source Specific Multicast Block
233.0.0.0	- 233.255.255.255	(233/8)	GLOP Block
234.0.0.0	- 238.255.255.255		RESERVED
239.0.0.0	- 239.255.255.255	(239/8)	Administratively Scoped Block

The IANA generally assigns addresses from the Local Network Control, Internetwork Control, and AD-HOC blocks. Assignment guidelines for each of these blocks, as well as for the Source Specific Multicast, GLOP and Administratively Scoped Blocks, are described below.

3. Local Network Control Block (224.0.0/24)

Addresses in the Local Network Control block are used for protocol control traffic that is not forwarded off link. Examples of this type of use include OSPFIGP All Routers (224.0.0.5) [RFC2328].

3.1. Assignment Guidelines

Pursuant to section 4.4.2 of RFC 2780 [RFC2780], assignments from the Local Network Control block follow an Expert Review, IESG Approval or Standards Action process. See [IANA] for the current set of assignments.

4. Internetwork Control Block (224.0.1/24)

Addresses in the Internetwork Control block are used for protocol control that must be forwarded through the Internet. Examples include 224.0.1.1 (NTP [RFC2030]) and 224.0.1.68 (mdhcpdiscover [RFC2730]).

4.1. Assignment Guidelines

Pursuant to section 4.4.2 of RFC 2780 [RFC2780], assignments from the Internetwork Control block follow an Expert Review, IESG Approval or Standards Action process. See [IANA] for the current set of assignments.

5. AD-HOC Block (224.0.2.0/24 - 224.0.255.0/24)

Addresses in the AD-HOC block have traditionally been assigned for those applications that don't fit in either the Local or Internetwork Control blocks. These addresses are globally routed and are typically used by applications that require small blocks of addressing (e.g., less than a /24).

5.1. Assignment Guidelines

In general, the IANA SHOULD NOT assign addressing in the AD-HOC Block. However, the IANA may under special special circumstances, assign addressing from this block. Pursuant to section 4.4.2 of RFC 2780 [RFC2780], assignments from the AD-HOC block follow an Expert Review, IESG Approval or Standards Action process. See [IANA] for the current set of assignments.

6. SDP/SAP Block (224.2/16)

Addresses in the SDP/SAP block are used by applications that receive addresses through the Session Announcement Protocol [RFC2974] for use via applications like the session directory tool (such as SDR [SDR]).

6.1. Assignment Guidelines

Since addresses in the SDP/SAP block are chosen randomly from the range of addresses not already in use [RFC2974], no IANA assignment policy is required. Note that while no additional IANA assignment is required, addresses in the SDP/SAP block are explicitly for use by SDP/SAP and MUST NOT be used for other purposes.

7. Source Specific Multicast Block (232/8)

The Source Specific Multicast (SSM) is an extension of IP Multicast in which traffic is forwarded to receivers from only those multicast sources for which the receivers have explicitly expressed interest, and is primarily targeted at one-to-many (broadcast) applications. Note that this block as initially assigned to the VMTP transient groups [IANA].

7.1. Assignment Guidelines

Because the SSM model essentially makes the entire multicast address space local to the host, no IANA assignment policy is required. Note, however, that while no additional IANA assignment is required, addresses in the SSM block are explicitly for use by SSM and MUST NOT be used for other purposes.

8. GLOP Block (233/8)

Addresses in the GLOP block are globally scoped statically assigned addresses. The assignment is made by mapping a domain's autonomous system number into the middle two octets of 233.X.Y.0/24. The mapping and assignment is defined in [RFC2770].

8.1. Assignment Guidelines

Because addresses in the GLOP block are algorithmically pre-assigned, no IANA assignment policy is required. In addition, RFC 3138 [RFC3138] delegates assignment of the GLOP sub-block mapped by the RFC 1930 [RFC1930] private AS space (233.252.0.0 - 233.255.255.255) to the Internet Routing Registries. Note that while no additional IANA assignment is required, addresses in the GLOP block are assigned for use as defined in RFC 2770 and MUST NOT be used for other purposes.

9. Administratively Scoped Address Block (239/8)

Addresses in the Administratively Scoped Address block are for local use within a domain and are described in [RFC2365].

9.1. Assignment Guidelines

Since addresses in this block are local to a domain, no IANA assignment policy is required.

9.1.1. Relative Offsets

The relative offsets [RFC2365] are used to ensure that a service can be located independent of the extent of the enclosing scope (see RFC 2770 for details). Since there are only 256 such offsets, the IANA should only assign a relative offset to a protocol that provides an infrastructure supporting service. Examples of such services include the Session Announcement Protocol [RFC2974]. Pursuant to section 4.4.2 of RFC 2780 [RFC2780], assignments of Relative Offsets follow an Expert Review, IESG Approval or Standards Action process. See [IANA] for the current set of assignments.

10. Annual Review

Given the dynamic nature of IPv4 multicast and its associated infrastructure, and the previously undocumented IPv4 multicast address assignment guidelines, the IANA should conduct an annual review of currently assigned addresses.

10.1. Address Reclamation

During the review described above, addresses that were mis-assigned should, where possible, be reclaimed or reassigned.

The IANA should also review assignments in the AD-HOC, DIS Transient Groups, and ST Multicast Groups blocks and reclaim those addresses that are not in use on the global Internet (i.e, those applications which can use SSM, GLOP, or Administratively Scoped addressing, or are not globally routed).

11. Use of IANA Reserved Addresses

Applications MUST NOT use addressing in the IANA reserved blocks.

12. Security Considerations

The assignment guidelines described in this document do not alter the security properties of either the Any Source or Source Specific multicast service models.

13. Acknowledgments

The authors would like to thank Joe St. Sauver, John Meylor, Randy Bush, and Thomas Narten for their constructive feedback and comments.

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16. Full Copyright Statement

Acknowledgement

Funding for the RFC Editor function is currently provided by the Internet Society.