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Multicast Addresses for Documentation

Abstract

This document discusses which multicast addresses should be used for documentation purposes and reserves multicast addresses for such use. Some multicast addresses are derived from AS numbers or unicast addresses. This document also explains how these can be used for documentation purposes.

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This document is not an Internet Standards Track specification; it is published for informational purposes.

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1. Introduction

It is often useful in documentation, IETF documents, etc., to provide examples containing IP multicast addresses. For documentation where examples of general purpose multicast addresses are needed, one should use multicast addresses that will never be assigned or in actual use. There is a risk that addresses used in examples may accidentally be used. It is then important that the same addresses not be used by other multicast applications or services. It may also be beneficial to filter out such addresses from multicast signalling and to filter out multicast data sent to such addresses.

For unicast, there are both IPv4 and IPv6 addresses reserved for this purpose; see [RFC5737] and [RFC3849], respectively. This document reserves multicast addresses for this same purpose.

There are also some multicast addresses that are derived from AS numbers or unicast addresses. For examples where such addresses are desired, one should derive them from the AS numbers and unicast addresses reserved for documentation purposes. This document also discusses the use of these.

2. IPv4 Multicast Documentation Addresses

For Any-Source Multicast (ASM), the IPv4 multicast addresses allocated for documentation purposes are 233.252.0.0 - 233.252.0.255 (233.252.0.0/24).

For Source-Specific Multicast (SSM), it is less important which multicast addresses are used, since a host/application joins a channel identified by both source and group. Any source addresses used in SSM examples should be unicast addresses reserved for documentation purposes. There are three unicast address ranges provided for documentation use in [RFC5737]. The ranges are 192.0.2.0/24, 198.51.100.0/24 and 203.0.113.0/24.

Sometimes one wants to give examples where a specific type of address is desired. For example, for text about multicast scoping, one might want the examples to use addresses that are to be used for administrative scoping. See below for guidance on how to construct specific types of example addresses.

2.1. Administratively Scoped IPv4 Multicast Addresses

Administratively scoped IPv4 multicast addresses [RFC2365] are reserved for scoped multicast. They can be used within a site or an organization. Apart from a small set of scope-relative addresses, these addresses are not assigned. The high order /24 in every scope is reserved for relative assignments. A relative assignment is an integer offset from the highest address in the scope and represents an IPv4 address. For documentation purposes, the integer offset is 10. This provides one multicast address per scope.

For example in the Local Scope 239.255.0.0/16, the multicast address for documentation purposes is 239.255.255.245.

2.2. GLOP Multicast Addresses

GLOP [RFC3180] is a method for deriving IPv4 multicast group addresses from 16-bit AS numbers. For examples where GLOP addresses are desired, the addresses should be derived from the AS numbers reserved for documentation use.

The 16-bit AS numbers reserved for documentation use in [RFC5398] are 64496 - 64511. By use of [RFC3180], we then get 16 /24 multicast prefixes for documentation use. The first one is 233.251.240.0/24, and the last one is 233.251.255.0/24.

2.3. Unicast Prefix-Based IPv4 Multicast Addresses

IPv4 multicast addresses can be derived from IPv4 unicast prefixes, see [RFC6034]. For examples where this type of address is desired, the addresses should be derived from the unicast addresses reserved for documentation purposes, see [RFC5737].

There are three unicast address ranges provided for documentation use in [RFC5737]. The ranges are 192.0.2.0/24, 198.51.100.0/24, and 203.0.113.0/24. Using [RFC6034], this leaves the unicast prefix-based IPv4 multicast addresses 234.192.0.2, 234.198.51.100, and 234.203.0.113.

3. IPv6 Multicast Documentation Addresses

For Any-Source Multicast (ASM), the IPv6 multicast addresses allocated for documentation purposes are FF0X::DB8:0:0/96. This is a /96 prefix so that it can be used with group IDs, according to the allocation guidelines in [RFC3307]. Also note that for these addresses, the transient flag, or "T-flag" as defined in [RFC4291], is zero. This is because they are permanently assigned. There can be no permanently assigned addresses for documentation purposes with the transient flag set to one, since the flag set to one means that they are not permanently assigned.

For Source-Specific Multicast (SSM), it is less important which multicast addresses are used, since a host/application joins a channel identified by both source and group. Any source addresses used in SSM examples should be unicast addresses reserved for documentation purposes. The IPv6 unicast prefix reserved for documentation purposes is 2001:DB8::/32, see [RFC3849].

Sometimes one wants to give examples where a specific type of address is desired. For example, for text about multicast scoping, one might want the examples to use addresses that are to be used for administrative scoping. See below for guidance on how to construct specific types of example addresses.

3.1. Unicast Prefix-Based IPv6 Multicast Addresses

IPv6 multicast addresses can be derived from IPv6 unicast prefixes, see [RFC3306]. For examples where this type of address is desired, the addresses should be derived from the unicast addresses reserved for documentation purposes.

The IPv6 unicast prefix reserved for documentation purposes is 2001:DB8::/32, see [RFC3849]. This allows a wide range of different IPv6 multicast addresses. Using just the base /32 prefix, one gets the IPv6 multicast prefixes FF3X:20:2001:DB8::/64 -- one for each available scope X. One can also produce longer prefixes from this. Just as an example, one can pick a /64 prefix 2001:DB8:DEAD:BEEF::/64, which gives the multicast prefixes FF3X:40:2001:DB8:DEAD:BEEF::/96 -- one for each available scope X.

3.2. Embedded-RP IPv6 Multicast Addresses

There is a type of IPv6 multicast address called an "Embedded-RP" address, where the IPv6 address of a Rendezvous-Point (RP) is embedded inside the multicast address, see [RFC3956]. For examples where this type of address is desired, the addresses should be derived from the unicast addresses reserved for documentation purposes, see [RFC3849].

For documentation purposes, the RP address can be any address from the range 2001:DB8::/32 that follows the constraints specified in [RFC3956]. One example address could be 2001:DB8::1. The Embedded-RP multicast prefixes might then be FF7X:120:2001:DB8::/96. Another example could be the RP address 2001:DB8:BEEF:FEED::7, which gives the prefixes FF7X:740:2001:DB8:BEEF:FEED::/96. See also the examples in [RFC3956].

4. Security Considerations

The use of specific multicast addresses for documentation purposes has no negative impact on security.

5. IANA Considerations

IANA has added a reference to this document for the IPv4 MCAST-TEST-NET allocation so that all the different documentation multicast assignments reference this document.

IANA has assigned a scope-relative IPv4 address for documentation purposes.

IANA has assigned "variable-scope" IPv6 multicast addresses for documentation purposes. This is a /96 prefix.

6. Acknowledgments

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7. Informative References

- [RFC2365] Meyer, D., "Administratively Scoped IP Multicast", BCP 23, RFC 2365, July 1998.
- [RFC3180] Meyer, D. and P. Lothberg, "GLOP Addressing in 233/8", BCP 53, RFC 3180, September 2001.
- [RFC3306] Haberman, B. and D. Thaler, "Unicast-Prefix-based IPv6 Multicast Addresses", RFC 3306, August 2002.
- [RFC3307] Haberman, B., "Allocation Guidelines for IPv6 Multicast Addresses", RFC 3307, August 2002.
- [RFC3849] Huston, G., Lord, A., and P. Smith, "IPv6 Address Prefix Reserved for Documentation", RFC 3849, July 2004.
- [RFC3956] Savola, P. and B. Haberman, "Embedding the Rendezvous Point (RP) Address in an IPv6 Multicast Address", RFC 3956, November 2004.
- [RFC4291] Hinden, R. and S. Deering, "IP Version 6 Addressing Architecture", RFC 4291, February 2006.
- [RFC5398] Huston, G., "Autonomous System (AS) Number Reservation for Documentation Use", RFC 5398, December 2008.
- [RFC5737] Arkko, J., Cotton, M., and L. Vegoda, "IPv4 Address Blocks Reserved for Documentation", RFC 5737, January 2010.
- [RFC6034] Thaler, D., "Unicast-Prefix-Based IPv4 Multicast Addresses", RFC 6034, October 2010.

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