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Unicast-Prefix-based IPv4 Multicast Addresses
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Abstract

Draft

Uni-Prefix-based IPv4 Multicast

November 2001

This specification defines an extension to the multicast addressing architecture of the IP Version 4 protocol. The extension presented in this document allows for unicast-prefix-based allocation of multicast addresses. By delegating multicast addresses at the same time as unicast prefixes, network operators will be able to identify their multicast addresses without needing to run an inter-domain allocation protocol.

1. Introduction

[RFC 2770](#) [[GLOP](#)] defined an experimental allocation mechanism in 233/8 whereby an Autonomous System (AS) number is embedded in the middle 16 bits of an IPv4 multicast address, resulting in 256 multicast addresses per AS. Advantages of this mechanism include the ability to get multicast address space without an inter-domain multicast address allocation protocol, and the ease of determining the AS of the owner of an address for debugging and auditing purposes.

Some disadvantages of GLOP include:

- o only 256 addresses are automatically available per AS, and obtaining any more requires administrative effort.
- o when an AS covers multiple sites or organizations, administration of the multicast address space within an AS must be handled by other mechanisms, such as manual administrative effort or MADCAP [[MADCAP](#)].
- o during debugging, identifying the AS does not immediately identify the owning organization, when an AS covers multiple organizations.

More recently, a mechanism [[VGUPBM](#)] has been developed for IPv6 which provides a multicast range to every IPv6 subnet, which is at a much finer granularity than an AS. As a result, the latter two disadvantages above are avoided (and the first disadvantage does not apply to IPv6 due to the extended size of the address space).

Two significant advantages of providing multicast space to every subnet (rather than just to an entire AS) are that:

- o multicast address allocation within the range need only be coordinated within the subnet (e.g., via ZMAAP [[ZMAAP](#)]), and

Expires May 2002

[Page 2]

Draft

Uni-Prefix-based IPv4 Multicast

November 2001

hence can be done with zero configuration.

- o bidirectional shared tree routing protocols may easily locate the direction to the root by doing a route lookup on a unicast address derived from the multicast group address.

This draft specifies a mechanism similar to [[V6UPBM](#)], whereby a range of IPv4 multicast address space is provided to most IPv4 subnets. A resulting advantage over GLOP is that the mechanisms in IPv4 and IPv6 become more similar.

[2.](#) Address Space

IANA should assign a /8 for this mechanism (e.g., the 225/8 which was previously leased to MASC). The remaining 24 bits will be used as follows:

Bits:	8	Unicast Prefix Length	24 - Unicast Prefix Length
	+-----+	-----	+-----+
Value:	225	Unicast Prefix	Group ID
	+-----+	-----	+-----+

For subnets with a /24 or shorter prefix, the unicast prefix of the subnet is appended to the common /8. Any remaining bits may be locally assigned by hosts within the link (e.g., using manual configuration, or ZMAAP). Individual subnets with a prefix length longer than 24 do not receive any multicast address space from this mechanism; in such cases, MADCAP may be used.

Compared to GLOP, an AS will receive more address space via this mechanism if it has more than a /16 for unicast space. An AS will receive less address space than it does from GLOP if it has less than a /16.

[3.](#) Security Considerations

Since dynamic assignment does not cross domain boundaries, the same well known intra-domain security techniques can be applied as with GLOP. Furthermore, the approach described here may have the effect of reduced exposure to denial of space attacks based on dynamic allocation, since the area of dynamic allocation is reduced from an entire AS to only within individual subnets.

Expires May 2002

[Page 3]

Draft Uni-Prefix-based IPv4 Multicast November 2001

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[5.](#) References

[GLOP]

Meyer, D., and P. Lothberg, "GLOP Addressing in 233/8", [RFC 2770](#), February 2000.

[MADCAP]

Hanna, S, Patel, B., and M. Shah, "Multicast Address Dynamic Client Allocation Protocol (MADCAP)", [RFC 2730](#), December 1999.

[V6UPBM]

Haberman, B., and D. Thaler, "Unicast-Prefix-based IPv6 Multicast Addresses", [draft-ietf-ipngwg-uni-based-mcast-03.txt](#), October 2001.

[ZMAAP]

Catrina, O., Thaler, D., Aboba, B., and E. Guttman, "Zeroconf Multicast Address Allocation Protocol (ZMAAP)", [draft-ietf-zeroconf-zmaap-02.txt](#), October 2001.

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Expires May 2002

[Page 4]

Draft

Uni-Prefix-based IPv4 Multicast

November 2001

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Expires May 2002

[Page 5]