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Category   Best Current Practices
                                                    January, 2003

Source-Specific Protocol Independent Multicast in 232/8

<draft-ietf-mboned-ssm232-04.txt>

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3. Abstract

IP Multicast group addresses in the 232/8 (232.0.0.0 to
232.255.255.255) range are designated as source-specific multicast
[SSM] destination addresses and are reserved for use by source-
specific applications and protocols [IANA]. This document defines
operational recommendations to ensure source-specific behavior within
the 232/8 range.

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].

4. Introduction

Current PIM Sparse Mode [RFC2362] relies on the shared Rendezvous
Point (RP) tree to learn about active sources for a group and to
support group-generic (not source specific) data distribution. The IP
Multicast group address range 232/8 has been designated for source-
specific [SSM] applications and protocols [IANA] and SHOULD support
source-only trees only, precluding the requirement of an RP and a
shared tree; active sources in the 232/8 range will be discovered out
of band. PIM Sparse Mode Designated Routers (DR), with local
membership, are capable of joining the shortest path tree for the
source directly using Source-Specific PIM [SSM].

Operational best common practices in the 232/8 group address range
are necessary to ensure shortest path source-only trees across
multiple domains in the Internet [SSM], and to prevent data from
sources sending to groups in the 232/8 range from arriving via shared
trees. This avoids unwanted data arrival, and allows several sources
to use the same group address without conflict at the receivers.

The operational practices SHOULD

 o Prevent local sources from sending to shared tree

 o Prevent remote sources from being learned/joined via MSDP [MSDP]

 o Prevent receivers from joining the shared tree

     o Prevent RP's as candidates for 232/8

5. Operational practices in 232/8

5.1. Preventing local sources from sending to shared tree

   Eliminating the use of shared trees for groups in 232/8, while
   maintaining coexistence with PIM-SM, behavior of the RP and/or the DR
   needs to be modified. This can be accomplished by

   - preventing data for 232/8 groups from being sent encapsulated to
     the RP by the DR

   - preventing the RP from accepting registers for 232/8 groups from
     the DR

   - preventing the RP from forwarding accepted data down (*,G)
     tree for 232/8 groups

5.2. Preventing remote sources from being learned/joined via MSDP

   PIM-SS does not require active source announcements via MSDP. All
   source announcements are received out of band, the the last hop
   router is responsible for sending (S,G) joins directly to the source.
   To prevent propagation of SAs in the 232/8 range, an RP SHOULD

   - never originate an SA for any 232/8 groups

   - never accept or forward an SA for any 232/8 groups.

5.3. Preventing receivers from joining the shared tree

   Local PIM domain practices need to be enforced to prevent local
   receivers from joining the shared tree for 232/8 groups. This can be
   accomplished by

   - preventing DR from sending (*,G) joins for 232/8 groups

   - preventing RP from accepting (*,G) join for 232/8 groups

   However, within a local PIM domain, any last-hop router NOT

preventing (*,G) joins may trigger unwanted (*,G) state toward
the RP which intersects an existing (S,G) tree, allowing the
receiver on the shared tree to receive the data, breaking the
source-specific [SSM] service model. It is therefore recommended
that ALL routers in the domain MUST reject AND never originate
(*,G) joins for 232/8 groups.

5.4. Preventing RP's as candidates for 232/8

Because PIM-SS does not require an RP, all RPs SHOULD NOT offer them¡
selves as candidates in the 232/8 range. This can be accomplished by

 - preventing RP/BSR from announcing in the 232/8 range

 - preventing ALL routers from accepting RP delegations in the
   232/8 range

 - precluding RP functionality on RP for the 232/8 range

6. Informative References

[IANA]   http://www.iana.org

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

7. Normative References

[MSDP]   D. Meyer and Bill Fenner (Editors), "The Multicast
            Source Discovery Protocol (MSDP)",
            draft-ietf-msdp-spec-14.txt, November 2002.

[SSM]   Holbrook, H., Cain, B., "Source-Specific Multicast",
            draft-ietf-ssm-arch-01.txt, November, 2002.

[RFC2362]   D. Estrin, et. al., "Protocol Independent Multicast-Sparse
            Mode (PIM-SM): Protocol Specification", RFC 2362, June,
            1998.

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