

INTERNET-DRAFT  
[draft-ietf-mboned-ssm232-06.txt](#)

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Best Current Practice  
September 2003

Category  
Expires: March 2004

**Source-Specific Protocol Independent Multicast in 232/8**  
**<[draft-ietf-mboned-ssm232-06.txt](#)>**

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### 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 multicast applications and protocols. This document defines operational recommendations to ensure source-specific behavior within the 232/8 range.

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## [1.](#) Introduction

Current PIM Sparse Mode (PIM-SM) [[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 PIM [[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 (also know as PIM-SSM or simply 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 receivers from joining the shared tree
- o Prevent RP's as candidates for 232/8
- o Prevent remote sources from being learned/joined via MSDP [[MSDP](#)]

## **2. Operational practices in 232/8**

### **2.1. 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

### **2.2. Preventing remote sources from being learned/joined via MSDP**

PIM-SSM does not require active source announcements via MSDP. All source announcements are received out of band, the the last hop router being 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.



### **2.3. 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.

In those cases in which an ISP is offering its customers (or others) the use of the ISP's RP, the ISP SHOULD NOT allow (\*,G) joins in the 232/8 range.

### **2.4. Preventing RP's as candidates for 232/8**

Because PIM-SSM does not require an RP, all RPs SHOULD NOT offer themselves 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

Note that in typical practice, RP's announce themselves as candidates for the 224/4 (which obviously includes 232/8). It is still acceptable to allow the advertisement of 224/4 (or any other superset of 232/8); however, this approach relies on the second point, above, namely, that routers silently just ignore the RP delegation in the 232/8 range, and prevent sending or receiving using the shared tree, as described previously. Finally, an RP SHOULD NOT be configured as a candidate RP for 232/8 (or more specific range).



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### **4. Acknowledgments**

This document is the work of many people in the multicast community, including (but not limited to) Dino Farinacci, John Meylor, John Zwiebel, Tom Pusateri, Dave Thaler, Toerless Eckert, Leonard Giuliano, Mike McBride, and Pekka Savola.

### **5. Security Considerations**

This document describes operational practices that introduce no new security issues to either PIM-SM or PIM-SSM.

However, in the event that the operational practices described in this document are not adhered to, some problems may surface. In particular, [section 2.3](#) describes the effects of non-compliance of last-hop routers (or to some degree, rogue hosts sending PIM messages themselves) on the source-specific service model; creating the (\*,G) state for source-specific (S,G) could enable a receiver to receive data it should not get. This can be mitigated by host-side multicast





source filtering.

## **6. IANA Considerations**

This document creates no new requirements on IANA namespaces [[RFC2434](#)].

## [7.](#) References

### [7.1.](#) Normative References

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- [IANA] <http://www.iana.org>

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