Troubleshooting PIM−5−SA_ENCAP_INVALID Error Messages

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Introduction

This document provides background information and tips on how to troubleshoot this log message. The message may be reported continuously by a router configured with Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP) routing protocols.

```
Jan 14 10:07:22: %PIM−5−SA_ENCAP_INVALID: Bad SA from RP
141.142.12.1 for (0.0.32.32, 224.2.140.231).
Trace = 2020 E904C801 8D8E650E −Process= "MSDP Process", ipl= 0, pid= 108
```

In this condition, these symptoms are experienced:

- Reported source address (SA) can vary.
- More than one PIM rendezvous point (RP) can report the problem.
- Valid SAs can also be received from the same RP.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Understand How MSDP Works

In order to understand the `PIM−5−SA_ENCAP_INVALID` message, you can refer to more detailed information about How MSDP Works.

PIM−5−SA_ENCAP_INVALID Messages

MSDP−SA messages contain (source, group (S,G)) information for RPs (called MSDP peers) in PIM sparse−mode (PIM−SM) domains. This mechanism allows RPs to learn about multicast sources in remote PIM−SM domains so that they can join those sources if there are local receivers in their own domain. You can also use MSDP between multiple RPs in a single PIM−SM domain to establish MSDP mesh groups.

When an MSDP SA message is received, the router checks the IP header of the original multicast packet. The SA message identifies the source, the group to which the source sends, and the RP's own address or the originator ID, if configured.

If a PIM router configured as an MSDP peer receives an SA with encapsulated data that is invalid, it drops the packet and reports this log message:

```
%PIM−5−SA_ENCAP_INVALID: Bad SA from RP 141.142.12.1 for (141.142.214.8, 224.2.177.155).
Trace = 45000014 99710000 7E11AD8E
```

These packets fail a sanity check on the encapsulated IP header. In most cases, Cisco has determined that a third−party first−hop DR sends corrupted SA packets. However, contact Cisco Technical Support if the address reported in the message is reachable.

Since the encapsulated packet was received with MSDP headers, Cisco IOS® performs a sanity check on the packet by checking that the datagram size is greater than the User Datagram Protocol (UDP) packet size. This check is performed on the encapsulated packet before forwarding the packet to downstream (non−RPF) MSDP peers. Originally, this process also checked the size against the RPF interface. However, the RPF interface for the source address in the SA can be null. In order to look for a null status, use the **show ip rpf x.x.x.x** command.

In this condition, your router can also report this log message:

```
Feb 15 07:32:40: %SYS−2−MALLOCFAIL: Memory allocation of 65496 bytes failed from
0x6017243C, pool Processor, alignment 0


Feb 15 07:32:40: −Process= "BGP Router", ipl= 0, pid= 109

Feb 15 07:32:40: −Traceback= 60174D44 60176EF0 60172444 60172C68

600BF2FC 600BF464 600CA850 6032DFB0 6030B468 60313398 604225C4 60422C68 6073DE88

60422D14 604298C8 6016F48C
```

This problem was first reported against Cisco IOS Software Release 12.0(10)S1 and is resolved in Cisco IOS Software Release 12.0(12)S. The root cause is a spurious memory access that results from an encapsulated MSDP SA message with a null RPF interface status.

Controll the Logging Output

In current versions of Cisco IOS software, a router reports `PIM−6−SA_ENCAP_INVALID` messages in the log only when **debug ip msdp** is enabled.

Alternately, you can filter the SA messages with the **ip msdp sa−filter** command. By default, MSDP exchanges SA messages without filtering them for specific source or group addresses. Refer to Multicast Source Discovery Protocol SA Filter Recommendations for more information.

Related Information

- **IP Multicast Support Page**
- **MSDP MIB**
- **RFC 3446**
- **Configuring a Rendezvous Point**
- **Anycast RP**
- **Interdomain Multicast Solutions Using MSDP**
- **IP Multicast Technology Overview**
- **Technical Support − Cisco Systems**

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