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IPv6 Router Alert Option for MPLS OAM
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Abstract

RFC 4379 defines the MPLS LSP Ping/Traceroute mechanism, in which the Router Alert Option MUST be set in the IP header of the MPLS Echo Request messages, and may conditionally be set in the IP header of the MPLS Echo Reply messages depending on the Reply Mode used. While a generic "Router shall examine packet" Option Value is used for the IPv4 Router Alert Option (RAO), there is no generic Router Alert Option Value defined for IPv6 that can be used. This document allocates a new generic IPv6 Router Alert Option Value that can be used by MPLS OAM tools, including the MPLS Echo Request and MPLS Echo Reply messages for MPLS in IPv6 environments. Consequently, it updates RFC 4379.

The initial motivation to request an IPv6 Router Alert Option (RAO) code point for MPLS OAM comes from MPLS LSP Ping/Traceroute. However, this code point is applicable to all MPLS OAM and not limited to MPLS LSP Ping/Traceroute.

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1. Introduction

A commonly deployed MPLS OAM tool is specified in [RFC4379], "Detecting Multi-Protocol Label Switched (MPLS) Data Plane Failures", which is used to diagnose MPLS network data planes. This specification [RFC4379], often referred to as "MPLS LSP Ping/ Traceroute", requires the use of Router Alert Option in the IP header. For example, the section 4.3 of [RFC4379] states that IP Router Alert Option MUST be set in the IP header of an MPLS Echo Request message. Similarly, the section 4.5 states that IP Router Alert Option MUST be set in the IP header of an MPLS Echo Reply message if the Reply Mode in the echo request is set to "Reply via an IPv4/IPv6 UDP packet with Router Alert".

[RFC2113] defines a generic Option Value 0x0 for IPv4 Router Alert Option (RAO) that is used in LSP Ping and LSP Traceroute for MPLS in IPv4 environments. However, currently there is no generic IPV6 Router Alert code point defined that can be used in LSP Ping and LSP Traceroute for MPLS in IPv6 environments. Specifically, [RFC2711]

defined the router alert for a general IPv6 purpose but required the Value field in the Router Alert Option to indicate a specific reason for using the Router Alert Option. Because there is no defined value for MPLS LSP Ping/Traceroute use or for general use, it is not possible for MPLS OAM tools to use the IPv6 Router Alert mechanism.

As vendors are starting to implement MPLS on IPv6 control plane (e.g., [I-D.ietf-mpls-ldp-ipv6]), there is a need to define and allocate such a code point for IPv6 in order to comply with [RFC4379]. This document defines a new IPv6 Router Alert Option Value that can be used by MPLS OAM tools, including the MPLS Echo Request and MPLS Echo Reply messages for MPLS in IPv6 environments.

2. Specification of Requirements

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

3. IPv6 Router Alert Option (RAO) Value for MPLS OAM

This document defines a new option value (TBD1) for the IPv6 Router Alert Option (RAO) to alert transit routers to examine the packet more closely for MPLS OAM purposes. This code point is used by any MPLS OAM application that requires their packets to be examined by a transit router.

In the scope of this document, this code point will be used by the MPLS Echo Request and MPLS Echo Reply for its IPv6 messages as required by [RFC4379].

4. Updates to RFC 4379

[RFC4379] specifies the use of the Router Alert Option in the IP header. Sections 4.3 and 4.5 of [RFC4379] are updated as follows: for every time in which the "Router Alert IP option" is used, the following text is appended:

> In case of an IPv4 header, the generic IPv4 Router Alert Option value 0x0 [RFC2113] SHOULD be used. In case of an IPv6 header, the IPv6 Router Alert Option value TBD1 allocated through this document for MPLS OAM MUST be used.

5. IANA Considerations

This document defines a new code point (value TBD1) for IPv6 Router Alert Option to alert transit routers to examine the packet the MPLS OAM purpose. IANA is requested to assign a new code point under its

"IPv6 Router Alert Option Values" registry defined by [RFC5350] and maintained in [IANA-IPv6-RAO]. The new code point is as follows:

value	Description	Reference
TBD1	MPLS OAM	[document.this]

6. Security Considerations

This document introduces no new security concerns in addition to what have already been captured in [RFC4379] and [RFC6398].

7. Acknowledgments

The authors would like to thank George Swallow, Ole Troan, Bob Hinden, Faisal Iqbal, Mathew Janelle, and Gregory Mirsky for their useful input.

8. References

8.1. Normative References

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