                    IPv6 Router Alert Option for MPLS OAM
                      draft-ietf-mpls-oam-ipv6-rao-02

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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   This Internet-Draft is submitted in full conformance with the
   provisions of BCP 78 and BCP 79.

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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]
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6. Security Considerations

This document introduces no new security concerns in addition to what
have already been captured in [RFC4379] and [RFC6398], the latter of
which expands the security considerations of [RFC2113] and [RFC2711].

7. Acknowledgments

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Hinden, Faisal Iqbal, Mathew Janelle, and Gregory Mirsky for their
useful input.

8. References

8.1. Normative References

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[RFC4379]   Kompella, K. and G. Swallow, "Detecting Multi-Protocol
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[RFC5350]   Manner, J. and A. McDonald, "IANA Considerations for the
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[RFC6398]   Le Faucheur, F., "IP Router Alert Considerations and
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8.2. Informative References

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   [RFC2113] Katz, D., "IP Router Alert Option", RFC 2113, February
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