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# IPv6 Router Alert Option for MPLS OAM

(draft-raza-mpls-oam-ipv6-rao-00)

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# Problem Statement

- The LSP Ping/Traceroute specification [RFC4379] requires the use of Router Alert option (RAO) in the IP header:
  - Section 4.3 states that IP Router Alert option **MUST** be set for an MPLS Echo Request message.
  - Section 4.5 states that IP Router Alert option **MUST** be set for 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”.
- For MPLS OAM use, while there is a generic RAO defined for IPv4, there is no such generic value defined for IPv6.
- As vendors are starting to implement MPLS IPv6 (e.g., [draft-ietf-mpls-ldp-ipv6], [draft-ietf-mpls-ipv6-only-gap]), there is a need to define and allocate such a code point for IPv6 in order to comply with RFC 4379 and use LSP Ping/Traceroute.

# Generic RAO

- For IPv4, RFC 2113 defines a generic option value (0) for RAO that is used by LSP Ping and LSP Traceroute for MPLS IPv4.
  - IPv4 RAO value 0: “Router Shall examine packet”
- IANA: IPv4 Router Alert Option Values

Value 	Description 	Reference 
0	Router shall examine packet	<a href="#">[RFC2113]</a>
1-32	Aggregated Reservation Nesting Level	<a href="#">[RFC3175]</a>
33-64	QoS NSLP Aggregation Levels 0-31	<a href="#">[RFC5974]</a>
65	NSIS NATFW NSLP	<a href="#">[RFC5973]</a>
66-65502	Unassigned	
65503-65534	Reserved for experimental use	<a href="#">[RFC5350]</a>
65535	Reserved	<a href="#">[RFC5350]</a>

# Generic RAO (cont'd)

- For IPv6, RFC 2711 defines the router alert for a general IPv6 purpose but required the Value field in the RAO to indicate a specific reason for using the RAO.
- IANA: IPv6 Router Alert Option Values

Value	Description	Reference
0	Datagram contains a Multicast Listener Discovery message	<a href="#">[RFC2710]</a>
1	Datagram contains RSVP message	<a href="#">[RFC2711]</a>
2	Datagram contains an Active Networks message	<a href="#">[RFC2711]</a>
3	Reserved	<a href="#">[RFC5350]</a>
4-35	Aggregated Reservation Nesting Level	<a href="#">[RFC3175]</a>
36-67	QoS NSLP Aggregation Levels 0-31	<a href="#">[RFC5974]</a>
68	NSIS NATFW NSLP	<a href="#">[RFC5973]</a>
69-65502	Unassigned	
65503-65534	Reserved for experimental use	<a href="#">[RFC5350]</a>
65535	Reserved	[The Internet Assigned Numbers Authority]

- Currently, MPLS OAM tools can not use this as there is no defined value for “general” use nor for MPLS OAM use.

# IPv6 RAO for MPLS OAM

- This I-D defines a new option value for the IPv6 RAO to instruct transit routers to examine the packet more closely for IPv6 MPLS OAM purposes.
- This new code point is to be assigned under IANA managed “IPv6 Router Alert Option Values” registry as originally defined by RFC 5350. The registry is updated as:

value	Description	Reference
TBD1	MPLS OAM	[this.I-D]
- This new option value (code point) is to be used by any IPv6 MPLS OAM application that requires their packets to be examined by a transit router.
  - In the scope of this I.D, this value will be used by the MPLS Echo Request and MPLS Echo Reply for its IPv6 messages

# I-D Status

- New draft, but gap identified in draft-ietf-mpls-ipv6-only-gap
- I-D also being presented in MPLS WG.
- Next Steps:
  - Seeking
    - WG feedback;
    - **WG adoption;**
    - Early allocation of the code point by IANA (to allow implementations to proceed)
- Thank you!