IETF 90 – Toronto
July 2014

IPv6 Router Alert Option for MPLS OAM

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

Kamran Raza

Nobo Akiya

Carlos Pignataro

(Cisco Systems, Inc.)

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	[RFC2113]
1-32	Aggregated Reservation Nesting Level	[RFC3175]
33-64	QoS NSLP Aggregation Levels 0-31	[RFC5974]
65	NSIS NATFW NSLP	[RFC5973]
66-65502	Unassigned	
65503-65534	Reserved for experimental use	[RFC5350]
65535	Reserved	[RFC5350]

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	[RFC2710]
1	Datagram contains RSVP message	[RFC2711]
2	Datagram contains an Active Networks message	[RFC2711]
3	Reserved	[RFC5350]
4-35	Aggregated Reservation Nesting Level	[RFC3175]
36-67	QoS NSLP Aggregation Levels 0-31	[RFC5974]
68	NSIS NATFW NSLP	[RFC5973]
69-65502	Unassigned	
65503-65534	Reserved for experimental use	[RFC5350]
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 has already been presented in IntArea WG on Mon.
- Next Steps:

  Seeking
  - WG feedback;
  - **WG adoption;**
  - Early allocation of the code point by IANA (to allow implementations to proceed)

- Thank you!