Inserting, Processing And Deleting IPv6 Extension Headers

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** UPDATES RFC 8200 **

RFC 8200 Text

Extension headers (except for the Hop-by-Hop Options header) are not processed, inserted, or deleted by any node along a packet's delivery path, until the packet reaches the node (or each of the set of nodes, in the case of multicast) identified in the Destination Address field of the IPv6 header.

The Hop-by-Hop Options header is not inserted or deleted, but may be examined or processed by any node along a packet's delivery path,until the packet reaches the node (or each of the set of nodes, in the case of multicast) identified in the Destination Address field of the IPv6 header. The Hop-by-Hop Options header, when present, must immediately follow the IPv6 header. Its presence is indicated by the value zero in the Next Header field of the IPv6 header.

What's Wrong With RFC 8200 Text

- No distinction between "the node identified in the Destination Address field of the IPv6 header" and "the final destination node".
  - They can be different when a Routing header is present
- Therefore, any node identified in the Routing header
  - Can insert any extension header
  - Can delete any extension header

What's Wrong With That?

- Header insertion can cause MTU blackholing

- Header insertion and deletion can interfere with communications between the source node and the final destination node
  - The source node sent a packet with a destination option
  - But a node along the delivery path deleted the Destination Option Header

- Header insertion and deletion leads to misattribution
  - The IPv6 Source Address should identify the packet's source
  - But a few extension headers were added by an unidentified node along the delivery path
  - And a few other extension headers were deleted by another unidentified node along the delivery path

What's Wrong With That? (Continued)

- Header insertion and deletion breaks any application that assumes the immutability of the Payload Length field in the IPv6 header
  - IPv6 Authentication Option
  - Others to be discovered?

Proposed Text

- Too long to fit on a slide
- Does not allow header insertion or deletion along packet's delivery path

Next Steps

- Good
  - Call for adoption

- Also good
  - Begin discussion on mailing list
  - Negotiate acceptable text

- Not so good
  - Declare inability to converge on acceptable text
  - Wait for an Internet Draft whose behavior is allowed by the current text, but is harmful