Approaches for Supporting IOAM in IPv6

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Key Issue

• IOAM Trace needs per-hop processing $\rightarrow$ IPv6 HbH EH
• IPv6 HbH EH must be the first EH
• Two issues of IOAM Trace in HbH EH:
  • Header can be large
  • Header changes its size at every hop
• Make accessing subsequent EHs (e.g., RH) difficult or even impossible
  • E.g., SRv6 in RH
Nonideal Workarounds

• When the IOAM overhead or size changing is of concerns, avoid using it.

• Only apply IOAM on SRv6 nodes → make IOAM option header/data an SRH option

• But we need IOAM to cover all the IPv6 nodes, so...
Possible Solutions

• IOAM Data Separate and Postpose
  • IOAM Instruction Header part in HbH EH, but IOAM data in an EH after RH
  • HbH is small and its size is fixed
  • Problem is: where to put the data. New EH? TLV on existing EH?

• Segment IOAM Export
  • Fix the IOAM overhead in HbH EH
  • Two sub-approaches
    • Independent of SRv6 → [I-D.song-ippm-segment-ioam]
    • Data export at each SRv6 node

• IOAM Direct Export
<table>
<thead>
<tr>
<th>Approach</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOAM Trace in HbH</td>
<td>Comply w/ IOAM Data Spec</td>
<td>Variable and long HbH header impeding access of later extension headers</td>
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<tr>
<td>IOAM Trace Data Separate and Postpose (Sec. 2)</td>
<td>Fix-size and short HbH header, good for later extension header access</td>
<td>Need extra extension header to hold trace data</td>
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<tr>
<td>Segment IOAM Data Export (Sec. 3.1)</td>
<td>Fix-size and controllable HbH header size</td>
<td>Need to enhance IOAM trace type data field spec.</td>
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<td>Trace Export at SRv6 nodes (Sec. 3.2)</td>
<td>Can be done through configuration</td>
<td>Specific to SRv6; No better than PB &amp; IOAM DEX in the worst case</td>
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<tr>
<td>IOAM Direct Export in HbH (Sec. 4)</td>
<td>Comply w/ IOAM DEX Spec; Fix-size and short HbH</td>
<td>Need export data correlation</td>
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Next Steps

- Reach consensus on proposal recommendation
- Develop the complete solution if any change/update is needed
- WG adoption