An IPv6 Routing Header for Source Routes with RPL
(draft-ietf-6man-rpl-routing-header-00)

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Background

• ROLL (Routing over Low-Power and Lossy nets)
• RPL - DV-based routing protocol for IPv6

• Problem
  • Route across nodes with very limited memory (< 8 kB)

• Solution
  • Use source routing in RPL domain to route across constrained nodes
  • Capable routers may insert/remove source routes on existing datagrams
Proposal

- Define new IPv6 Routing Header type (4)

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 |
| Next Header | Hdr Ext Len | Routing Type = 4 | Segments Left |
| Compr | Pad | Reserved |
| Addresses[1..n] |

- Same basic format as RH0
- Compr: Number of prefix bytes elided for each Address[i] (obtained from IPv6 dest address)
- Pad: Number of pad bytes after Address[n]
Proposed

- Processing similar to RH0 but adds constraints:
  - Used only for strict source route
  - Only used within a RPL routing domain
  - Verify that loops do not exist within the source route
- Define new ICMP Dest Unreach error
  - Sent when strict source route fails
- Use IP-in-IP when inserting/removing RH4
  - Does not modify original datagram
  - Addresses MTU issues
Status & Next Steps

- Just adopted as WG doc
- Comments/suggestions?