IPv6 Reflection Utility

draft-mh-6man-icmpv6-reflection-01

Merged From IETF 120

- draft-mcb-6man-icmpv6-loopback
- draft-he-6man-icmpv6-extensions-ipv6-ext-header

IPv6 Reflection Utility

- A diagnostic tool like PING [RFC 2151] and PROBE [RFC 8335]
- Allows a probing node to determine how a packet has changed between itself and a probed node

Do Packets Change In Flight?

- NAT's change the source and destination addresses
- Routers can change the traffic class / DSCP
- Routers can change mutable hop-by-hop and destination options
- Routers can change mutable fields in the Routing Header
- Middle-boxes SHOULD NOT, but do, change the Flow Label

Utility Mechanics: Probing Node

- Sends an ICMPv6 Extended Echo Request message to the probed node
- Extended Echo Request includes extension structure [RFC 4884]
- Extension structure includes one or more extension objects
  - Each extension object represents a piece of requested information
  - Each extension object includes a zero-filled payload field
  - Payload field is long enough to contain the requested information

Extension Objects: Examples

- Reflect All
  - Contains the IPv6 header, all of its extensions, and the ICMPv6 Extended Echo Request up to and including the ICMP extension header
- Reflect Request
  - Contains the ICMPv6 Extended Echo Request up to and including the ICMP extension header
- Reflect IPv6 header
  - Contains the incoming IPv6 header only
- Reflect HBH header
  - Contains the incoming HBH header only
- And many more……

Utility Mechanics: Probed Node

- Generates an ICMPv6 Extended Echo Reply Message
  - Copies extension structure from the Extended Echo Request Message to the Extended Echo Reply Message
  - Overwrites the payload fields with the requested information
- Sends the Extended Echo Reply Message back to the probing node

Next Steps

- WG Call For Adoption