Operational Issues Associated With Long IPv6 Header Chains

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ASIC-based IPv6 Forwarding

- Typical behavior
  - Copy N bytes from beginning of packet to on-chip memory
- Service Types
  - Basic: requires information from IPv6 header, hop-by-hop and routing extension header
    - Example: Plain old IPv6 forwarding
  - Enhanced: requires information from deeper inside the header chain (e.g. TCP header)
    - Examples: Load-balancing, firewall filtering
- Long header chains may adversely impact forwarder's ability to deliver enhanced services

Requirements for IPv6 forwarders

- MUST provide basic services regardless of header chain length
  - Don’t drop the packet
  - Process the entire hop-by-hop extension header
  - Process the entire routing extension header
- MUST provide enhanced services at a minimum level
  - Document limitations due to header chain length
  - Policy language must include a mechanism to identify packets that cannot be matched upon due to header chain length

Advice to Protocol Developers

- Many IPv6 implementations cannot offer enhanced services for packets with header chains in the range of 128-364 bytes
- Many network operators filter packets for which the cannot offer enhanced services
- Protocols that rely on long header chains should be used only in environments that are known to permit packets with long header chains