Generic Delivery Function
via
MPLS/BIER Extension Headers

PALS/MPLS/DetNET/Spring Joint Session, IETF111
GDF Recap

• Presentation at IETF110: https://datatracker.ietf.org/meeting/110/materials/slides-110-mpls-11-generic-delivery-functions-00

• Some IP Functions can be viewed as independent of IP
  • Fragmentation/reassembly, ESP/AH, In-Situ OAM

• What if we extract them out and apply to any layer?
  • IP, MPLS, BIER, Ethernet
  • “Generic Delivery Functions”
    • Between two points at a L2/L2.5/L3/whatever layer
      • Two Ethernet nodes
      • LSP ingress/egress
      • BIER ingress/egress
      • IP source/destination nodes
Previous GDFH – FYI only

| 0 0 0 0 | resvd | Header Len | Next Header | This Header |

Variable field per “this header type”

Generic Delivery Function Header

- “Next header” comes from “IP Protocol” number space
  - It could point to another GDFH or IP “next header”
- “This header” uses its own number space – for different GDFs
  - No need to take one number from IP “next header” space for each GDF
- Outer header indicates that a GDFH follows
  - MPLS label, BIER proto field, IP “next header”, EtherType
New Thoughts on GDF Types

• A GDF, being generic, is likely to be applicable to IP as well
  • Therefore, there is no need to have “This Header”
    • Just use certain IP extension headers for other layers
      • Maybe with small enhancements (when applied to other layers)
  • No need for IP Next Header code point for GDF either
    • Unless in future we need some GDFs that are truly not applicable to IP
      • We could then define a GDF container with an IP Next Header code point for GDF

• MPLS/BIER header needs a way to point to an IP EH
  • MPLS HEH serves that purpose
  • BIER needs something similar/simpler
New GDFH - as an MPLS EH

- Fragmentation uses extended IPv6 Fragmentation EH
  - S-bit indicates sender info is included along with identification
  - HLEN replaces “reserved” field in IPv6 Frag EH
    - If S-bit is set
- Other generic functions like ESP/AH/IOAM
Assign a codepoint for “proto” field in BIER to indicate BIER EH:

- An 8-bit IP Next Header number (e.g. 44 for Fragmentation) follows BIER header
  - Instead of an HEH for BIER
  - Alternatively, MPLS HEH could be generalized for BIER (and other layers) as well
- An IP Extension Header follows the above mentioned 8-bit field or HEH
Next Steps

• Update the draft and seek more comments