Using Entropy Label
to carry Indicators

draft-decraene-mpls-slid-encoded-entropy-label-id-03

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Entropy Label

- Defined in RFC 6790, used for load-balancing.

- Uses a stack of 2 labels:

  - Entropy Label Indicator (Special-Purpose Label 7)
  - Entropy Label (a per-flow entropy value)

- EL's TTL is essentially reserved for future use
  - Must Be Zero when sent and ignored when received

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+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|   Entropy Label Indicator (ELI) (7)    |   TC |0|     TTL     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|   Entropy Label (EL)                   |   TC |S|  TTL (MBZ)  |
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Define a new "Entropy Label Control" field

- Redefine the unused EL's TTL as the "Entropy Label Control" field.
  - Set of 8 flags: ELC0…ELC7

- Semantic of the bits are user-defined (i.e., not standardized)
  - To maximize the reusability of this scare resource in the MPLS header
  - An application using a flag MUST have it configurable

Benefits

- Faster deployment with incremental benefit.
  - Most/all egress LER already support ELI so won't drop the packet.
  - → Any new ingress LER may use the feature
    - Compared to a new SPL requiring *both* ingress and egress to be upgraded
    - e.g., usability of 25% vs 6% (25%^2) for a new SPL
- Minimize the label stack when load-balancing required
  - Adding Indicators to existing EL requires no extra labels in the stack
  - Defining a new SPL for (indicators, entropy) would require inserting both SPLs in the stack for years/decade until all LSR support the new SPL entropy
- Save a special purpose label
  - And save routing extensions to signal its support (LDP, RSVP-TE, BGP, IS-IS, OSPF, BGP-LS)

Examples of Indicators use cases

- End to end absolute loss measurement

    - Alternate marking (RFC8321 section 3.1)

- Indicates slice ID in part of the EL

Next steps

- Individual draft since 2020/12
  - Presented three times: IETF 110, IETF113, DT meeting
  - Some discussions on the MPLS WG mailing list

- Welcome more review and comments

- Requesting MPLS WG adoption call