draft-zzhang-bier-payload-label-00

BIER-WG, IETF123 Madrid

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Overview

- BIER Interop test results presented at IETF122 uncovered inconsistency in use of BIER in MPLS networks:
  - Proto field = 1 -> Payload is MPLS label stack packet, top label is downstream assigned
  - Proto field = 2 -> Payload is MPLS label stack packet, top label is upstream assigned
- MPLS downstream introduced in RFC3031
  - Was mean to be used when upstream unicasts the packet to downstream: Downstream can decide on label
- MPLS upstream introduced in RFC5332
  - Meant to be used when multicast is L2 multicast from upstream to multiple downstream nodes via L2 multicast
  - RFC5331 generalized „upstream assigned“ labels for RFC5332 and other potential use-cases.
- Upstream and Downstream predate – and where not updated by
  - SRGB - RFC8402
  - DCB - RFC9573
- Hence it was up to implementers to figure out themselves what to do correctly.
  - One logical thinking:
  - Multicast Downstream labels come from global LFIB -> use „1“ when using a global LFIB label
  - Multicast Upstream label come from a context LFIB -> use „2“ when using a label from a context LFIB
  - SRGB and DCB labels are implemented out of default LFIB -> use „1“

Target change in BIER registry / RFC8296

Value	Description	Reference
1	MPLS packet with downstream-assigned label at top of stack	[RFC8296]
2	MPLS packet with upstream-assigned label at top of stack	[RFC8296]

Value	Description	Reference
1	MPLS packet with the top of stack label to be looked up in the Default LFIB	[THISRFC]
2	MPLS packet with the top of stack label to be looked up in the Context-specific LFIB for the BFIR	[THISRFC]

Target RFC updates

Updates to RFC8296

- Downstream-assigned labels [RFC3031], "SR Global Block" (SRGB, [RFC8402]) and "Domain-wide Control Block" (DCB), [RFC9573] label use the Default LFIB for forwarding and to thus require use of value 1.
- Upstream-assigned labels [RFC5331], as used by [RFC5332], [RFC8556], and [RFC9624] require the use of a context-specific LFIB and do thus require use of value 2.
- New semantics for MPLS labels beyond the aforementioned (upstream, downstream, SRGB, DCB) SHOULD re-use one of these two pre-existing values unless they can not co-exist with the pre-existing MPLS label semantics in the forwarding plane. In that case, a new entry needsto be alloced in the registry.

Updates to RFC8402 and RFC9573

- This document specifies that "SR Global Block" (SRGB) labels as specified in [RFC8402]) and "Domain-wide Control Block" (DCB) labels as specified in [RFC9573] have to be indicated through a value of 1(default LFIB) when used as a top op stack label in an [RFC8296] BIER packet MPLS payload. This was underspecified in both RFCs.

Next steps

- Important to have for unambiguous / interoperable implementations
- Just painless clarification
- Think about it...

- Hopefully we can do a quick adoption call
- And get it through WG / IESG in record time
- And collect brownie points for reducing IETF RFC production time averages!

Questions ?