MPLS Data Plane Encapsulation for In-situ OAM Data

draft-gandhi-mpls-ioam-sr-05

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Agenda

- Requirements and Scope
- Summary
- Next Steps

Requirements and Scope

Requirements:

- Transport In-situ OAM (IOAM) data fields with MPLS Encapsulation

Scope:

- Using data fields defined in:
  - *draft-ietf-ippm-ioam-data*
  - *draft-ietf-ippm-ioam-direct-export*
  - *draft-ietf-ippm-ioam-flags*
- Edge-to-edge (E2E) IOAM
- Hop-by-hop (HbH) IOAM

IOAM Data Field Encapsulation in MPLS Header

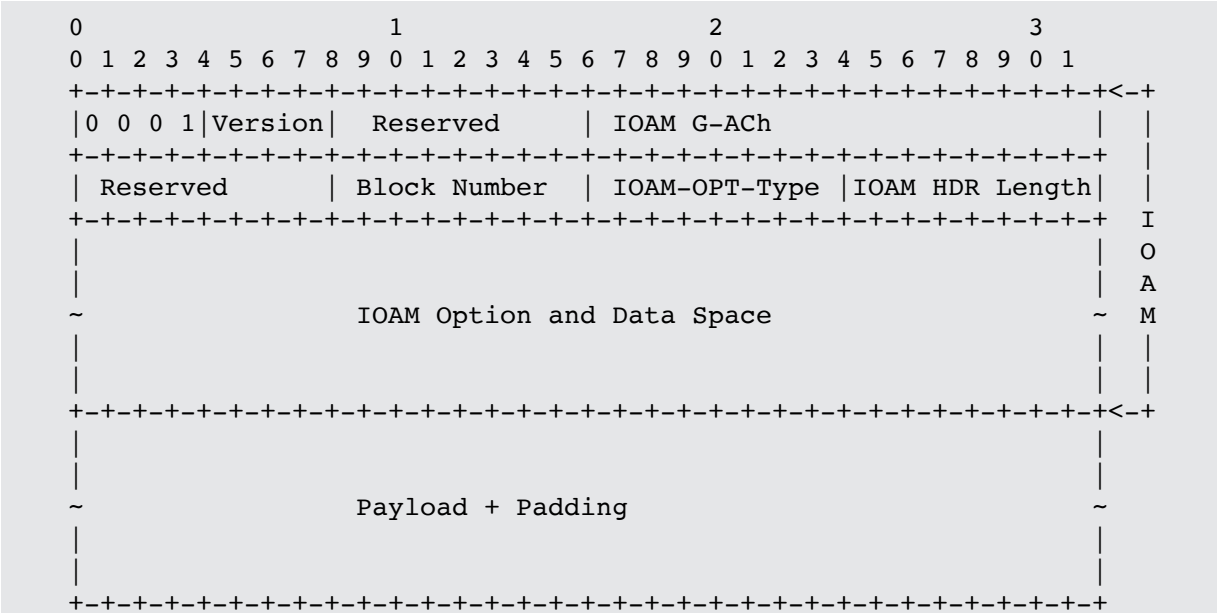

Figure: IOAM Encapsulation in MPLS Header

IOAM G-ACh Header

- New Generic Associated Channel (G-ACh) Type (value TBA3) defined for IOAM
- Protocol value *0001b* allows to avoid incorrect IP header based hashing over ECMP paths
- Block Number can be used to:
  - Aggregate IOAM data collected in data plane, e.g. compute measurement metrics for each block of a flow
  - Correlate IOAM data from different nodes

IOAM Indicator Label

- “IOAM Indicator Label” is used to indicate the presence of the IOAM data fields in the MPLS header after EOS.
- Separate Label values are used for E2E and HbH IOAM to optimize IOAM processing on transit nodes:
  - E2E Label TBA1
  - HbH Label TBA2

E2E IOAM Encapsulation in MPLS Header

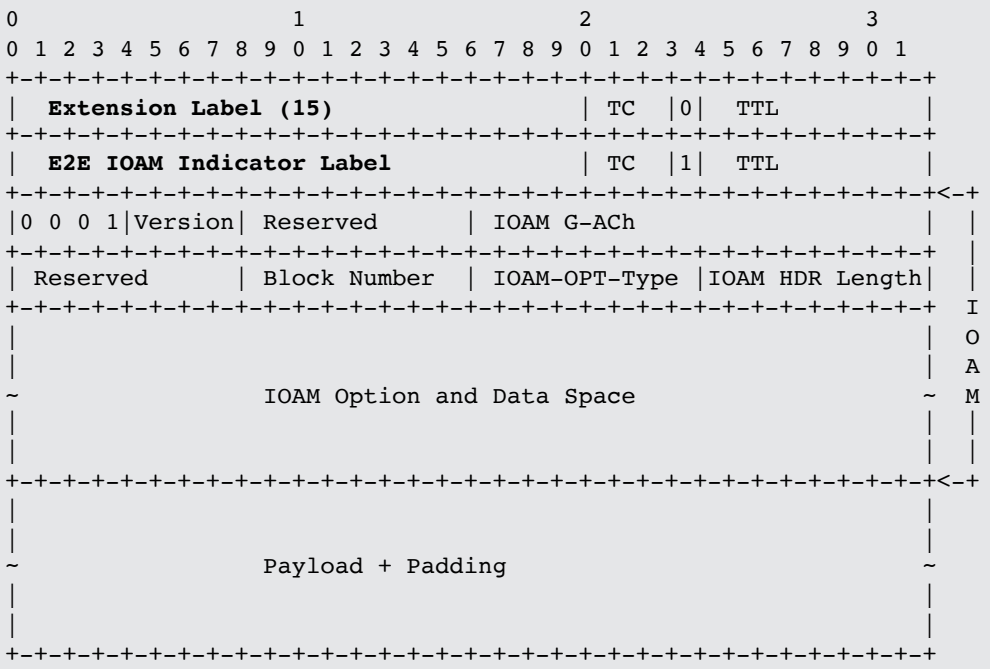

Figure: E2E IOAM Encapsulation in MPLS Header

E2E Indicator Label Allocation Methods

1. Label assigned by IANA with value TBA1
   - From Extended Special Purpose Labels (eSPL) range
2. Global Label allocated by a controller
   - The controller provisions the label on encapsulating and decapsulating nodes
3. The label allocated by the decapsulating node
   - Signaling mechanism used to convey the label to all encapsulating nodes (out of scope)

E2E IOAM Procedure

1. The encapsulating node inserts an E2E Indicator Label and one or more IOAM data field(s) in the MPLS header.
2. The decapsulating node for E2E IOAM "forwards and punts the timestamped copy" of the data packet including IOAM data field(s).
   - The decapsulating node for E2E IOAM also pops the IOAM Indicator Label and the IOAM data field(s) from the MPLS header.

HbH IOAM Encapsulation in MPLS Header

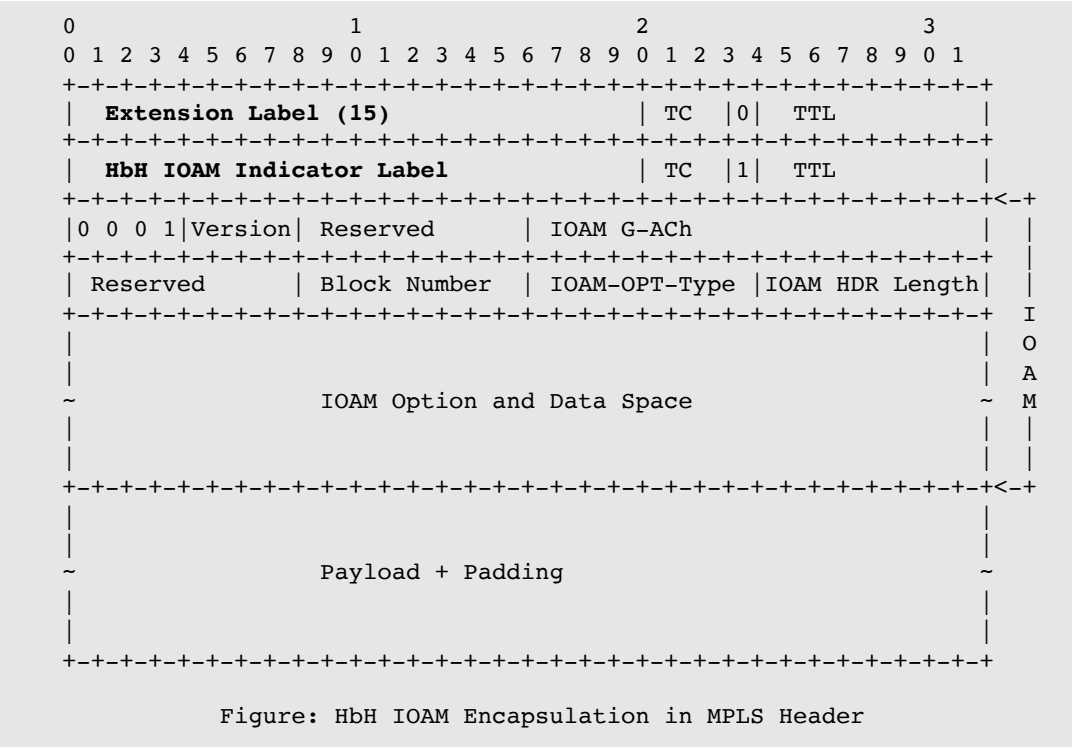

Figure: HbH IOAM Encapsulation in MPLS Header

HbH Indicator Label Allocation Methods

1. Label assigned by IANA with value TBA2
   - From Extended Special Purpose Labels (eSPL) range
2. Global Label allocated by a controller
   - The controller provisions the label on encapsulating, transit and decapsulating nodes

HbH IOAM Procedure

1. The encapsulating node inserts a HbH Indicator Label and one or more IOAM data field(s) in the MPLS header.
2. The transit node processes HbH IOAM data field(s) and forwards the data packet including updated IOAM data field(s).
3. The decapsulating node for HbH IOAM "forwards and punts the timestamped copy" of the data packet including IOAM data field(s).
   - The decapsulating node for HbH IOAM also pops the IOAM Indicator Label and the IOAM data field(s) from the MPLS header.

Next Steps

- Welcome your comments and suggestions
- Requesting MPLS WG adoption

Thank you

Backup

IOAM Encapsulation Example with SR-MPLS Header

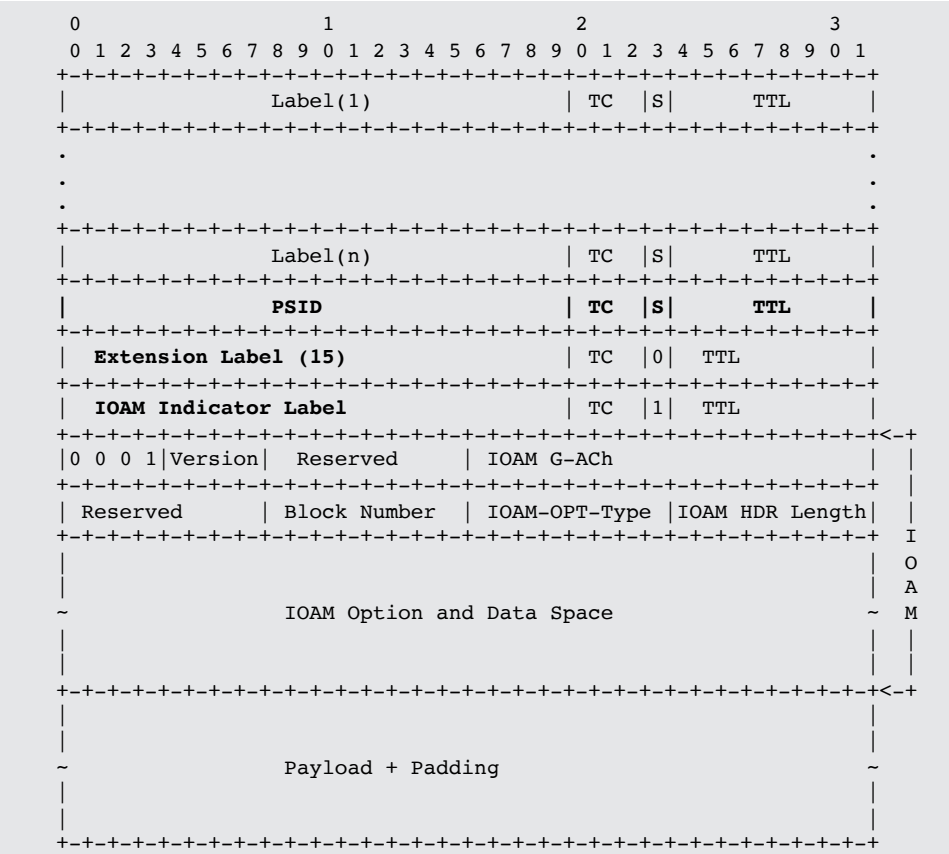

Figure: IOAM Encapsulation Example with SR-MPLS Header

Thank you