IOAM Update

IPPM WG,
IETF 106, Singapore - November 18, 10:00-12:00

IOAM related WG documents

- draft-ietf-ippm-ioam-data-08
- draft-ietf-ippm-ioam-flags-00
- draft-ietf-ippm-ioam-ipv6-options-00

IOAM Data Fields: draft-ietf-ippm-ioam-data

Draft-ietf-ippm-ioam-data: Updates from -06 to -07

Detailed review from Haoyu Song and review/IETF105 hackathon feedback from Tom Herbert issues/132 and issues/131 (many thanks to Haoyu and Tom):

Details (see Pull request #133)

- Trace-Type bit 23 changed to "reserved" to allow for future extensions
- Opaque State Snapshot changed to bit 22 (from bit 7) in Trace-Type
- Checksum complement changed to bit 7 (from bit 23) in Trace-Type
- Changed checksum complement to 4 octets

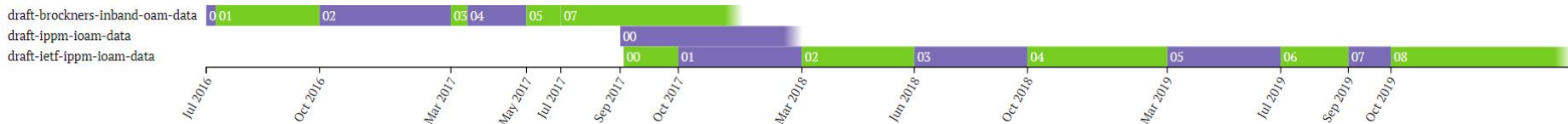# Draft-ietf-ippm-ioam-data:
Updates from -06 to -07 (contd.)

Details (contd.)

- Added a paragraph in section 4.2.2 that explicitly states that "short" and "wide" fields can be combined and can both be in the same packet.
- IOAM Option-Types is what is used throughout the document now (instead of IOAM Type, IOAM header, IOAM option etc.)
- Explained that pre-allocated and incremental trace options can go hand in hand
- Dedicated subsections in section 4 detailing IOAM nomenclature (aligns better with the fact that there was a dedicated subsection on namespaces)
- Editorial clean up

Draft-ietf-ippm-ioam-data:
Updates from -07 to -08

- Revision -08 fixes one small nit in draft-ietf-ippm-ioam-data-07 that got revealed in one of the design team meetings of the "IOAM direct export" group: issues/135

- Define handling of flags or options unknown to a node in draft-ietf-ippm-ioam-data on decap:
Decap nodes at the edge of an IOAM domain MUST remove all IOAM Option-Types and associated encap headers.

draft-ietf-ippm-ioam-data-06 - Next Steps

draft-brockners-inband-oam-data | 0 | 01 | 02 | 03 | 04 | 05 | 07 |
draft-ippm-ioam-data | 00 |
draft-ietf-ippm-ioam-data | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |

Jul 2016 | Oct 2016 | Mar 2017 | May 2017 | Jul 2017 | Sep 2017 | Oct 2017 | Mar 2018 | Jun 2018 | Oct 2018 | Mar 2019 | Jul 2019 | Sep 2019 | Oct 2019

- Document has gone through many iterations;
  Input from 2 Hackathons (IETF 100, IETF 105)
- Document is stable - the only active discussion was around flags which now moved to a new document

- Document is considered ready for WGLC

IOAM Flags
draft-ietf-ippm-ioam-flags-00

draft-ietf-ippm-ioam-flags-00

IPPM WG adopted draft-mizrahi-ippm-ioam-flags-00 as draft-ietf-ippm-ioam-flags-00

- This draft is a complement of draft-ietf-ippm-ioam-data (content originated from draft-ietf-ippm-ioam-data-05)
- Document split was done to separate stable parts from parts which require more discussion, enabling progression at different speeds

- Draft-ietf-ippm-ioam-flags-00 only discusses "active" and "loopback"flags: "immediate export" is now subsumed in Design Team work on draft-ioamteam-ippm-ioam-direct-export-00

draft-ietf-ippm-ioam-flags-00

Updates in -00 version

- Draft-ietf-ippm-ioam-flags-00 only discusses "active" and "loopback"flags: "immediate export" is now subsumed in Design Team work on draft-ioamteam-ippm-ioam-direct-export-00

- Update to Performance Considerations (section 7) reflecting discussion that IOAM packets with flags could impact device performance: It MUST be possible to use each of the mechanisms on a subset of the data traffic.

draft-ietf-ippm-ioam-flags-00: Next Steps

Consider WGLC to progress draft-ietf-ippm-ioam-flags in lockstep with draft-ietf-ippm-ioam-data

IOAM IPv6 Options
draft-ietf-ippm-ioam-ipv6-options-00

draft-ietf-ippm-ioam-ipv6-options-00

IPPM WG adopted draft-ioametal-ippm-6man-ioam-ipv6-options-02 as draft-ietf-ippm-ioam-ipv6-options-00

Informational reference to draft-ioametal-ippm-6man-ioam-ipv6-deployment for deployment considerations of the new option types added to draft-ietf-ippm-ioam-ipv6-options-00

WG adoption of draft allows for early allocation 2 IPv6 Option Types.

draft-ietf-ippm-ioam-ipv6-options-00: Next steps

- Early allocation of option numbers for interoperable implementations?
- More reviews?

BACKUP

Loopback Flag ("L-Bit")
(existing since WG adopted I-D, i.e. draft-ietf-ippm-ioam-data-00)

- Loopback Flag allows a source node to discover the path of a packet within a single RTT.
- Loopback flag triggers each transit node to send a copy of the packet back to the source, along with forwarding the packet.
  - Assumption is that a return path exists
  - Encapsulating node MUST be the source of the packet
  - Encapsulating node sets L-bit for specific packets; Could combine with the A-bit.
  - L-bit is cleared for packet returned to the source (i.e. the copy).

Immediate Export Flag ("I-Bit")
(originally introduced with draft-ietf-ippm-ioam-data-05)

- Enable to export telemetry data immediately from the network node to the collector, rather than embedding it into the packet
  - Encapsulating node sets the I-Bit.
  - Transit nodes are expected to export the requested data rather than add it to the packet.
  - Decapsulating node is expected to export the requested data and remove the IOAM header as usual.
- Motivations: Security, space, implementation simplicity, potential loss of telemetry data (packet drop => Embedded telemetry loss)
- Potentially coupled with e2e type to add flow/serial number context to the collector
- Discussion: Evolve flag to Immediate-Export IOAM Option

Active Flag - ("A-Bit")
(originally introduced with draft-ietf-ippm-ioam-data-05)

- Draft-ietf-ippm-ioam-data-6 includes in, "Scope, Applicability, and Assumptions" section
  - "Combination with active OAM mechanisms: IOAM should be usable for active network probing, …"
  - However, no mechanism was provided so far to distinguish packets used for specific measurements
- "Active" flag indicates that this is packet used for measurements
  - "Active" is used in the sense defined in RFC 7799
  - At the IOAM decapsulating node, in addition to processing and/or exporting trace metadata, the packet must be discarded rather than forwarded (after IOAM decapsulation).
- Examples:
  - Probes
  - Cloned or sampled (possibly truncated) copies of data packets