Alternate Marking method for passive performance monitoring

draft-ietf-ippm-alt-mark-04

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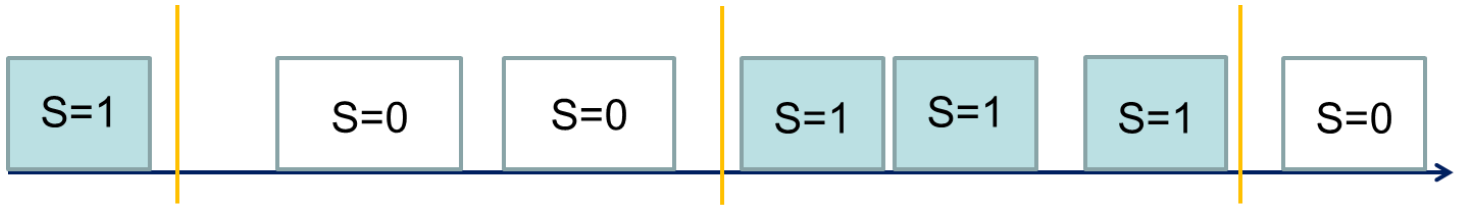
Document changes: -02 to -03 to -04

Important Modification:

- A definitive Delay Classification
  - Two main alternatives: Single Marking and Double Marking
  - Mean Delay is an optional feature that can be used
    - This addresses the comments received from Al Morton and Stewart Bryant (in Seoul)
  - New paragraph about Delay/Delay variation
    - Many Thanks to Al Morton for the help

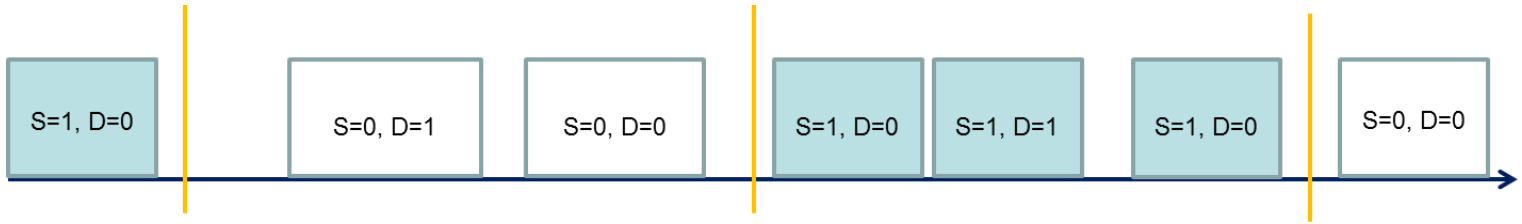
Delay Classification (1/2)

- Single Marking Methods



  - First/Last Packet of each batch: is sensitive to packet loss and packet re-ordering.
  - Mean Delay (all packets): no impact if packets get re-ordered.

- Double Marking Method



  - Collect and compare timestamps on D-marked packets to calculate packet delay.
  - Detailed Delay calculation on D-marked packets
  - Mean Delay on S-marked packets can be evaluated in comparison with mean delay of D-marked packets

Double Marking is certainly the most complete choice

Delay Classification (2/2)

- Mean Delay measure is not sufficient to characterize the sample, and more statistics of delay extent data are needed
- Double Marking method solves the issue: a subset of batch packets are selected for extensive delay calculation by using a second marking.
- A detailed analysis on these double marked packets can be performed:
  - e.g. percentiles, variance and median delay values.
  - the conventional range (maximum-minimum) should be avoided for several reasons, including stability of the maximum delay due to the influence by outliers.
  - RFC 5481 section 6.5 highlights how the 99.9th percentile of delay and delay variation is more helpful.

Update on Marking Method Use Cases

New versions of the following works:

- MPLS RFC6374: draft-ietf-mpls-flow-ident-03; draft-bryant-mpls-sfl-framework-03; draft-bryant-mpls-rfc6374-sfl-03

- BIER WG: draft-ietf-bier-pmmm-oam-01

- OOAM: draft-ooamdt-rtgwg-oam-gap-analysis-02
  Work in Progress in RTGWG, NVO3, SFC and BIER WGs

- SPRING WG: draft-vandevelde-spring-flow-aware-v6transport-00
  New proposal Flow Aware IPv6 Segment Routing

- IPPM WG: draft-mizrahi-ippm-multiplexed-alternate-marking-01; draft-fioccola-ippm-alt-mark-active-01

Overview of RFC6374 Synonymous Flow Labels

RFC6374 Packet Loss Measurement with SFL

- The data service packets of the flow are grouped into batches, and all the packets within a batch are marked with the SFL (draft-ietf-mpls-flow-ident)

- draft-ietf-ippm-alt-mark is the reference for this passive packet loss measurement

RFC6374 Packet Delay Measurement with SFL

- RFC6374 describes how to measure the packet delay by measuring the transit time of an RFC6374 packet over an LSP. SFL marking can be used also in this case.
    - RFC6374 packet may not need to be carried over an SFL since the delay over a particular LSP should be a function of the TC bits.
    - However if label inferred scheduling is used (RFC3270) then the SFL would be required to ensure that the RFC6374 packet experienced a representative delay.
- draft-fioccola-ippm-alt-mark-active-01 could be the reference for this active delay/delay variation measurement

Summary and Next Steps

- Consolidated Version of the Document.
- Considered Stable for the Content

- WGLC for this draft!

Comments always welcome