

Performance measurement with the alternate marking method in SFC

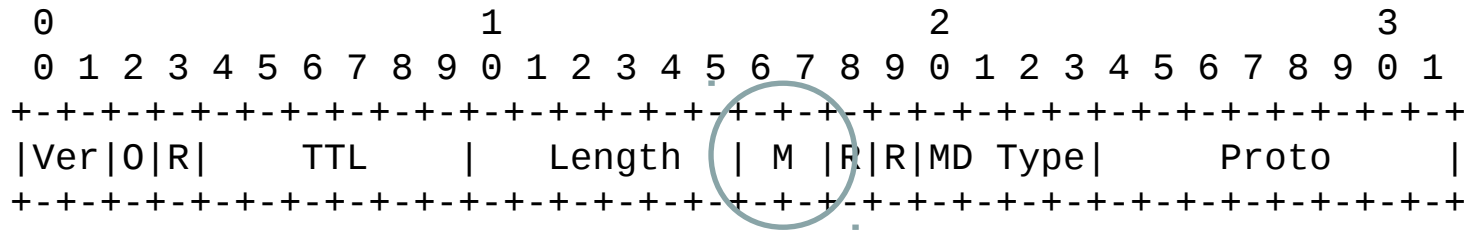
draft-mirsky-sfc-pmamm-01

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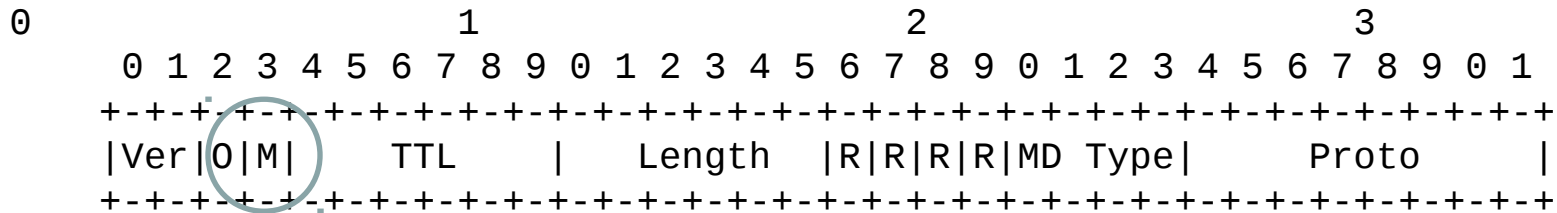
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Update



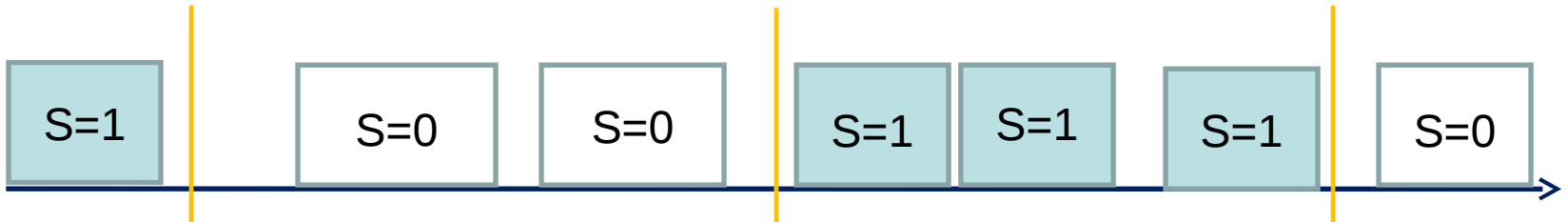
+---+ Mark field
 |S|D| S - single mark method
 +---+ D - double mark method



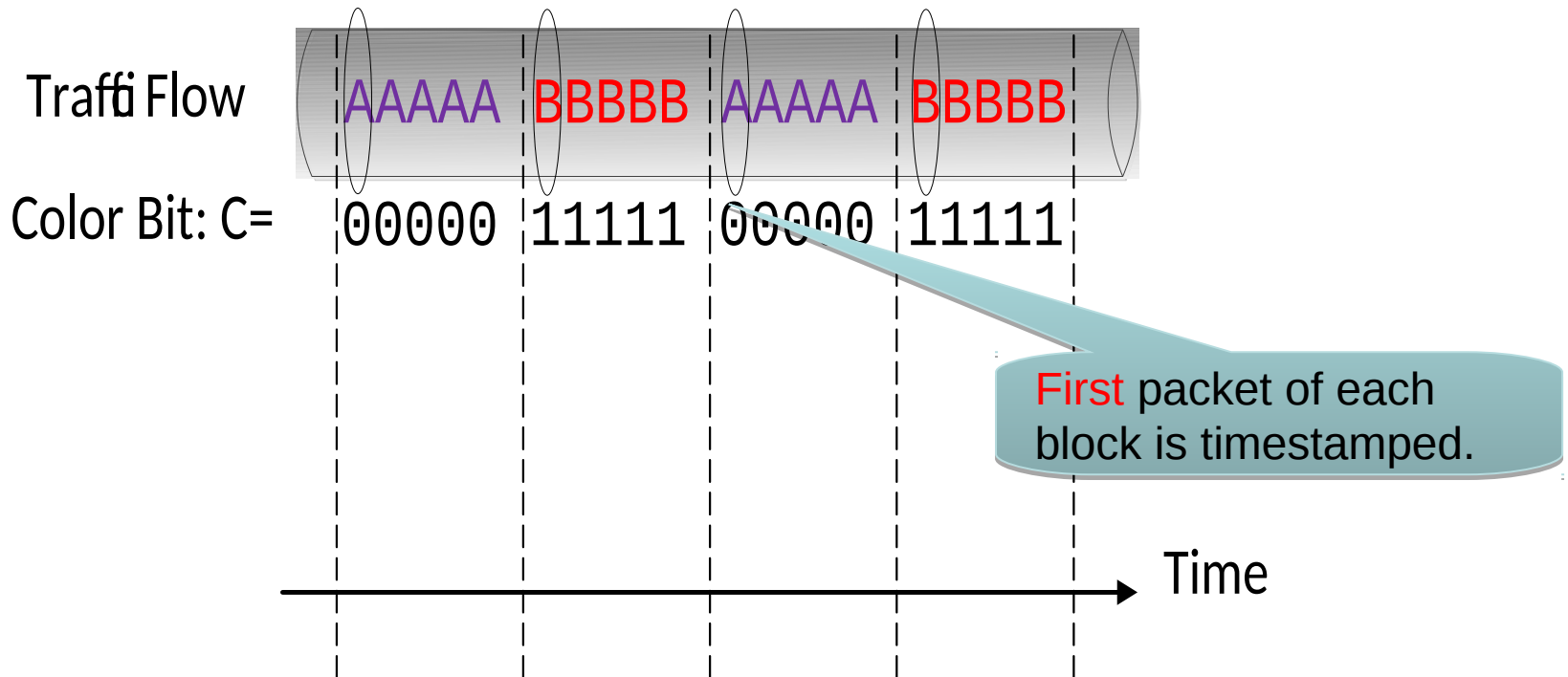
Mark - one bit-length field

Single Mark Method

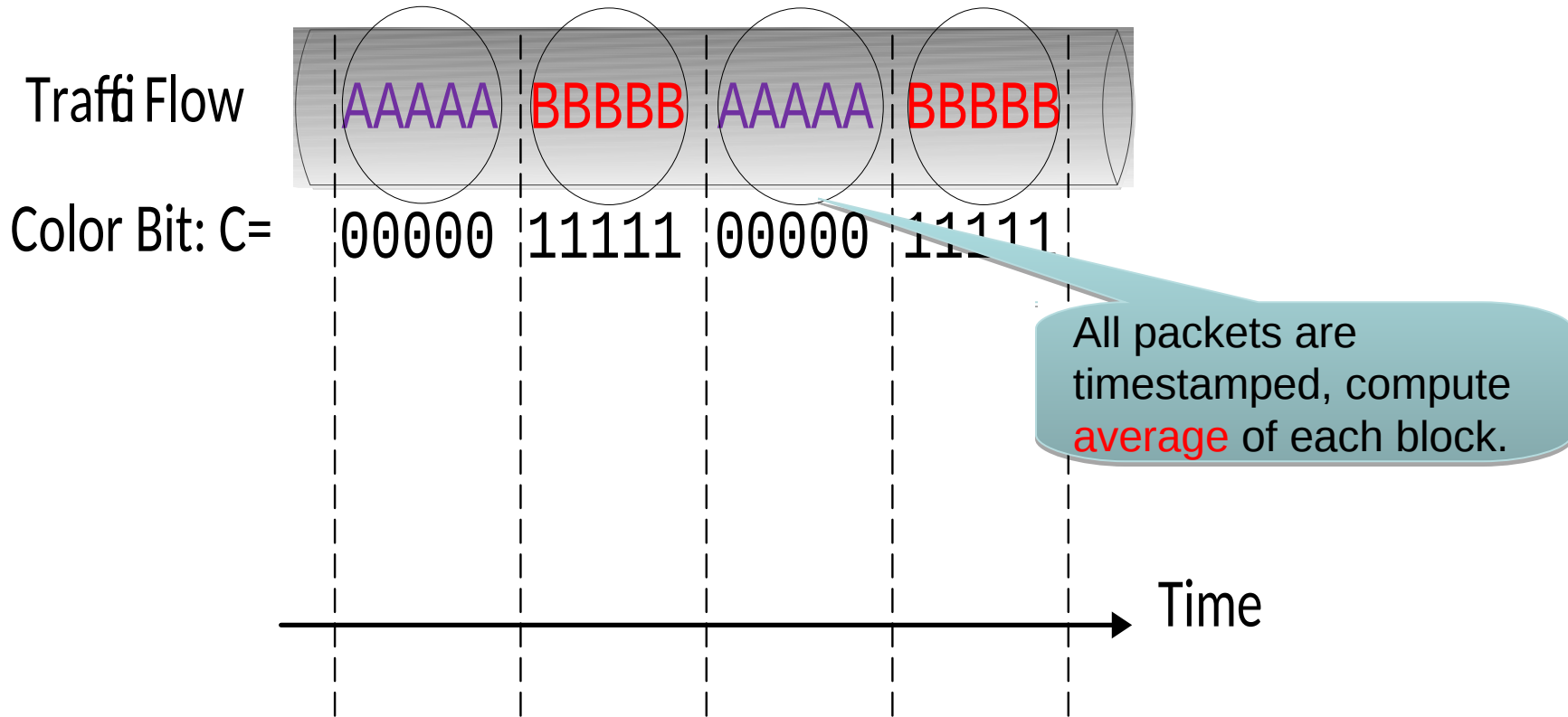
- Batching packets based on time interval to measure packet loss by switching value of the S flag. D flag MUST be set to 0 on transmit and ignored on receipt.
- First/Last Packet Delay calculation:
 - capture timestamp of when S flag value flips. Method is sensitive to packet loss and packet re-ordering
- Average Packet Delay calculation:
 - collect timestamps for each packet received within a single block. Average of the timestamp is the sum of all the timestamps divided by the total number of packets received. Hence minimally impacted by a packet loss and no impact if packets get re-ordered.
- Average Delay Variation calculation is possible



Single Mark – Delay Measurement

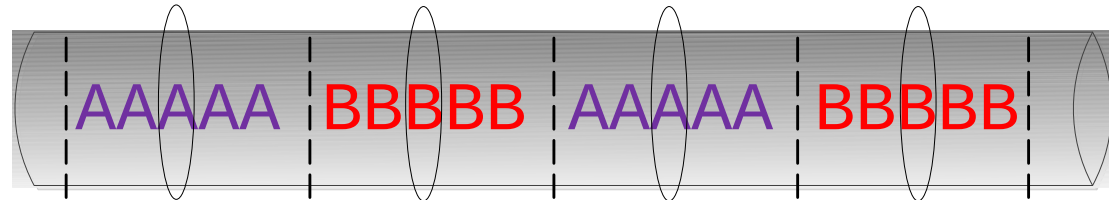


Single Mark – Mean Delay



Multiplexed Marking

Traffic Flow



Color Bit: C=

00000 11111 00000 11111

Timestamp Bit: T=

00100 00100 00100 00100

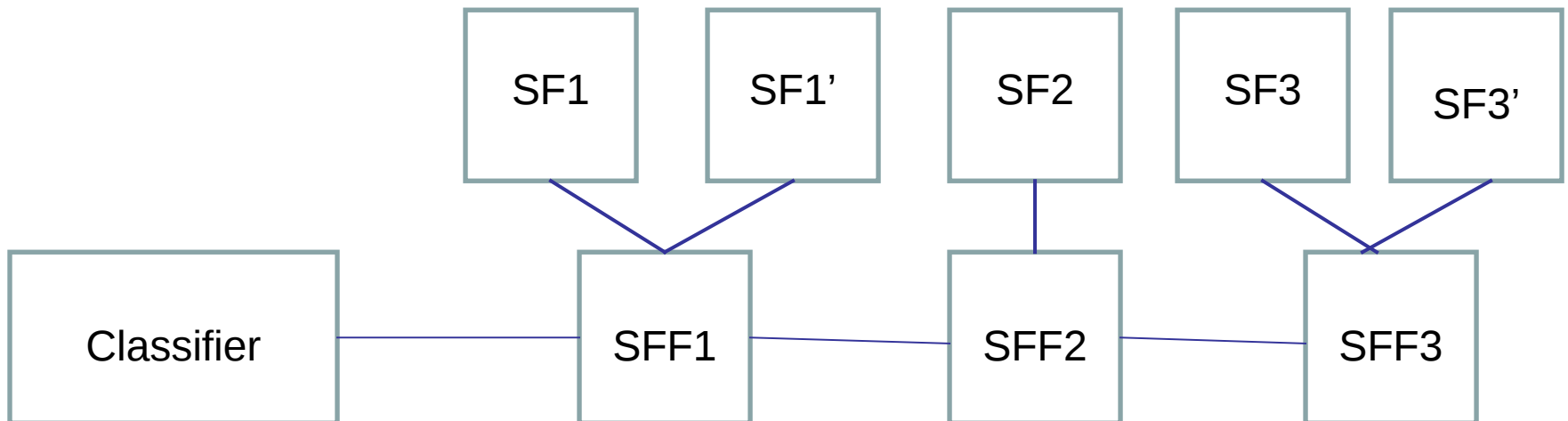
Using only one bit:
T xor C

00100 11011 00100 11011

Time

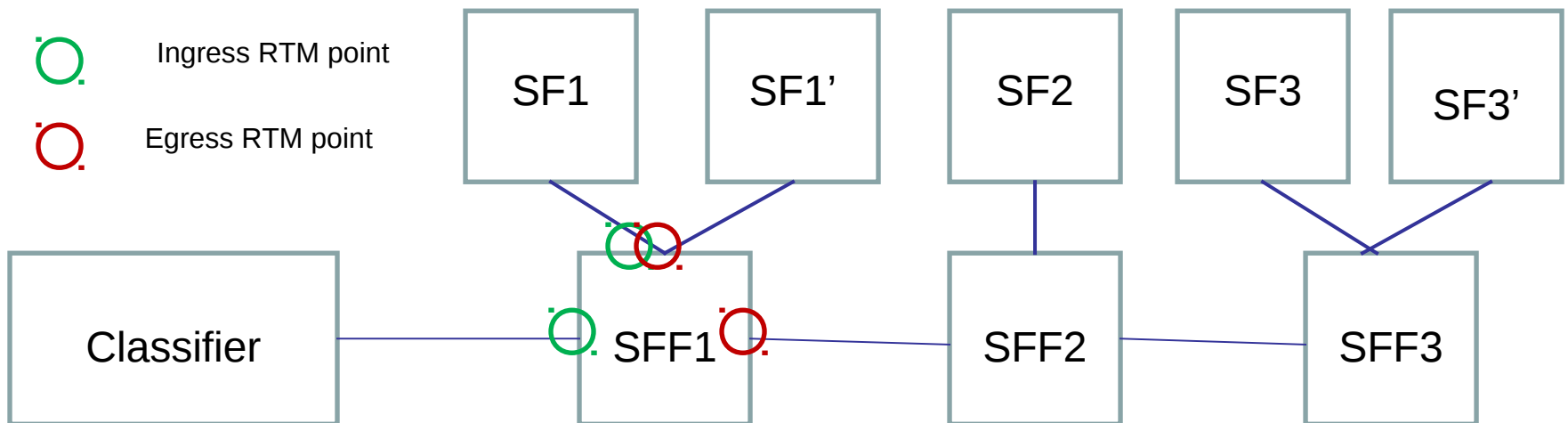
PMAMM Applicability

- The Classifier marks packets
- Measurement Point at SFF3 enables e2e Packet Loss measurement, efficient measurement of Mean (Average) Delay and full spectrum of timing metrics, e.g., minimum, maximum, median delay values, delay variation
- Measurement Point may be dynamically enabled at any of the SFC entities, e.g., any combination of SFs and/or SFFs, to localize service degradation



Residence Time Measurement

Residence time is the variable part of the propagation delay that a packet experiences while traversing a network, e.g., SFC. Residence Time over an SFC is the sum of the nodal residence times, i.e., periods that the packet spent in each of SFFs that compose the SFC. The nodal residence time in SFC itself is the sum of sub-nodal residence times that the packet spent in each of SFs that are part of the given SFC and are mapped to the SFF. The residence time and deviation of the residence time metrics may include any combination of minimum, maximum, values over measurement period, as well as mean, median, percentile. These metrics may be used to evaluate the performance of the SFC and its elements before and during its operation.



Next Steps

- Welcome questions, comments
- Address comments
- Adopt by WG

Thank you

Double Mark Method

- Use S flag to create batch of packets as in Single Mark method
- Use D flag to create new set of marked packets that are fully identified over the BIER network
- Collect and compare timestamps on D-marked packets to calculate more informative one-way packet delay metrics, such as minimum, maximum delay, median and percentiles values.
- Double mark method may be implemented by multiplexing fields or making certain assumptions about characteristic information that identifies the flow. More information can be found in draft-mizrahi-ippm-multiplexed-alternate-marking-02

