

M-PDM

draft-fear-ippm-mpdm-01

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Combines PDM and Marking

- RFC8250 : Performance and Diagnostic Metrics (PDM)
- RFC8321: Alternate-Marking Method for Passive and Hybrid Performance Monitoring

Why?

- PDM : IPv6 Destination Option provides packet sequence number and performance information end-to-end
- Marking provides error information
- Marking is IPv4 only
- Need one-way network path information as well as end-to-end metrics

PDM Fields

Performance and Diagnostic Metrics Destination Option (PDM) contains the following fields: (by 5-tuple)

- PSNTP : Packet Sequence Number This Packet
- PSNLR : Packet Sequence Number Last Received
- DELTATLR : Delta Time Last Received
- DELTATLS : Delta Time Last Sent
- SCALEDTDL : Scale for Delta Time Last Received
- SCALEDTLS : Scale for Delta Time Last Sent

PDM Provides:

- Round trip delay
- Server delay
- Does not provide one-way delay or middlebox delay

Marking Fields

- Marking can be applied to delineate blocks of packets based either on equal number of packets in a block or based on equal time interval.
- First/Last Batch Packet Delay calculation: timestamps are collected based on order of arrival so this method is sensitive to packet loss and re-ordering.
- Average Packet Delay calculation: an average delay is calculated by considering the average arrival time of the packets within a single block. This method only provides single metric for the duration of the block and it doesn't give information about the delay

M-PDM HBH Header

```
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
| Option Type | Option Length |Version|LastM |M | MType |Rsvd |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
| Middlebox Identifier          | Timestamp In          |
| ---+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
| Timestamp Out                | PSN This Packet      |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
```

--- [Room for 5 middleboxes]

```
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
| Middlebox Identifier          | Timestamp In          |
| ---+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
| Timestamp Out                | PSN This Packet      |
+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+
```

- Fixed length header
- Sent by source
- Each middlebox will update
- More than 5 will wrap
- LastM is Last Middlebox who updated.

Next Steps / Questions

- What should Middlebox identifier be?
- Collaborate with iOAM work? Inside an administrative domain?
- Comments?