Analysis of the EDO option

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Question from TCPM chairs

- *TCPM is currently developing EDO to extend the TCP header. MPTCP is one of the use cases for this header extension. Would you consider using EDO for MPTCP ?*

- Short answer : **NO**

- Detailed answer
  - draft-bonaventure-tcpm-edo-analysis-00

Design requirement for MPTCP

- From RFC6182

  - *The network compatibility goal requires that the multipath extension to TCP retain compatibility with the Internet as it exists today, including making reasonable efforts to be able to traverse predominant middleboxes*
  - *In addition, network compatibility must be retained to the extent that Multipath TCP MUST fall back to regular TCP if there are insurmountable incompatibilities for the multipath extension on a path.*

Does EDO meets these goals ?

Middlebox Interference	Outcome
Replacement of EDO with NOP	silently discarded by receiver but risk of blackhole
Removal of EDO	silently discarded by receiver but risk of blackhole
Data injection	ok
Segment splitting	some data parsed as option and then likely retransmitted
Segment coalescing	option passed as user data in the bytestream
Option injection	option passed as user data in the bytestream

Table 1: Summary of Middelbox interference with the EDO extension

Does EDO extended meets them ?

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+-----------------------+-----------------------------------------+
| Middlebox Interference | Outcome                                |
+-----------------------+-----------------------------------------+
| Replacement of EDO    | silently discarded by receiver but risk |
| with NOP              | of blackhole                            |
|                       |                                         |
| Removal of EDO        | silently discarded by receiver but risk |
|                       | of blackhole                            |
|                       |                                         |
| Data injection        | silently discarded by receiver but risk |
|                       | of blackhole                            |
|                       |                                         |
| Segment splitting     | silently discarded by receiver but risk |
|                       | of blackhole                            |
|                       |                                         |
| Segment coalescing    | silently discarded by receiver but risk |
|                       | of blackhole                            |
|                       |                                         |
| Option injection      | silently discarded by receiver but risk |
|                       | of blackhole                            |
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     Table 2: Summary of Middelbox interference with the EDO extension
                  with segment length validation
```

Conclusion

- Qualitative analysis reveals that ss currently specified, EDO appears at risk when middleboxes interfere
  - Some feedback from receiver seems requires

- Measurement analysis is required to get more data on existing middlebox interference
  - EDOREQUEST and EDO are implemented in tracebox (http://www.tracebox.org)
  - Tracebox tests will be developed to validate EDO and announced on the list