

Data Fields for DetNet Enhanced Data Plane

draft-xiong-detnet-data-fields-edp-04

Quan Xiong(ZTE)

Aihua Liu(ZTE)

Jinoo Joun(Sangmyung University)

Rakesh Gandhi(Cisco)

Dong Yang(Beijing Jiaotong University)

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Motivation and Updates

- Recap of Motivation:
 - define the metadata and common data fields for DetNet enhanced data plane solutions to support the deterministic latency and aggregated flow identification **as defined in draft-ietf-detnet-scaling-requirements**.
- The new version -04 updates is like following:
 - align with the suitable categories **as defined in draft-ietf-detnet-dataplane-taxonomy**.
 - revise the Deterministic Latency Metadata to align with the **adopted seven queuing solutions I-Ds**.
 - discuss the options of encodings for DetNet enhanced data plane metadata such as reuse of the existing DSCP/TC field and encapsulation considerations in IPv6,SRv6 and MPLS networks.
 - add Jinoo as a co-author and thanks for the suggestions.

Deterministic Latency Option

- Deterministic Latency Option is defined to carry the deterministic latency metadata aligning with the 7 categories in enhanced data plane for *forwarding nodes along the path which can apply the corresponding queuing mechanism and related information in the packet to achieve the end-to-end bounded latency*.
 - the 7 Deterministic Latency Types align with the 7 categories defined in draft-ietf-detnet-dataplane-taxonomy
 - the deterministic latency metadata align with 7 categories in enhanced data plane to carry the required information

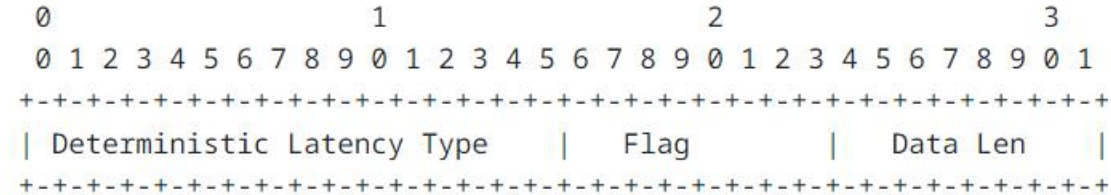


Figure 5 Deterministic Latency Option header

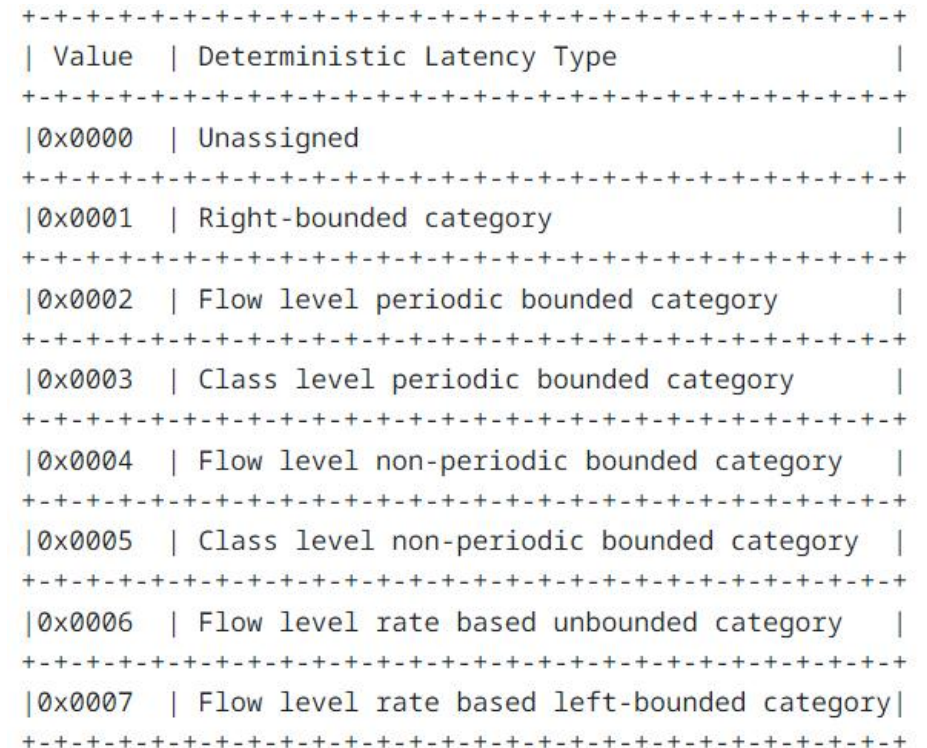


Figure 6 Deterministic Latency Type

Deterministic Latency Option (cont)

- Data Fields in Right-bounded Category
 - As per [I-D.ietf-detnet-dataplane-taxonomy], for solutions in the right-bounded category, a packet has only a maximum time bound. **An example is EDF [I-D.ietf-detnet-deadline-based-forwarding].**
- Data Fields in Flow Level Periodic Bounded Category
 - As per [I-D.ietf-detnet-dataplane-taxonomy], the flow Level periodic bounded solutions define a set of time slots, which will be scheduled for flows or flow aggregates. **An example is TQF [I-D.ietf-detnet-packet-timeslot-mechanism].**
- Data Fields in Class Level Periodic Bounded Category
 - As per [I-D.ietf-detnet-dataplane-taxonomy], the periodic bounded solutions can be further categorized by the traffic granularity with class level subcategory. The class Level periodic bounded solutions define a set of cycles and each cycle will be scheduled for flows of flow aggregates within a class level. **An example is TCQF [I-D.ietf-detnet-tcqf].**

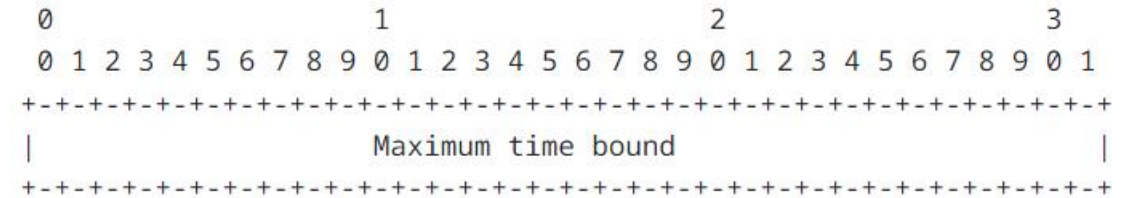


Figure 7 Data Field in Right-bounded Category

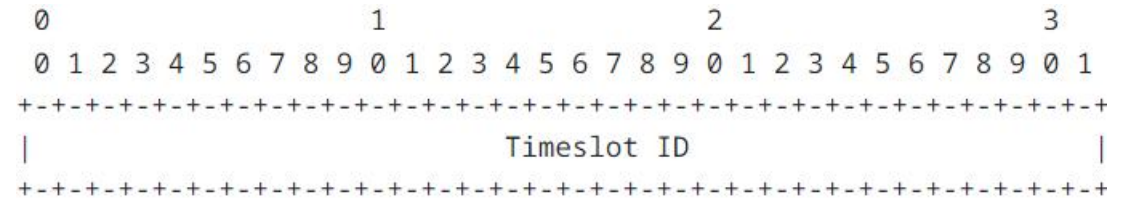


Figure 8 Data Field in Flow Level Periodic Bounded Category

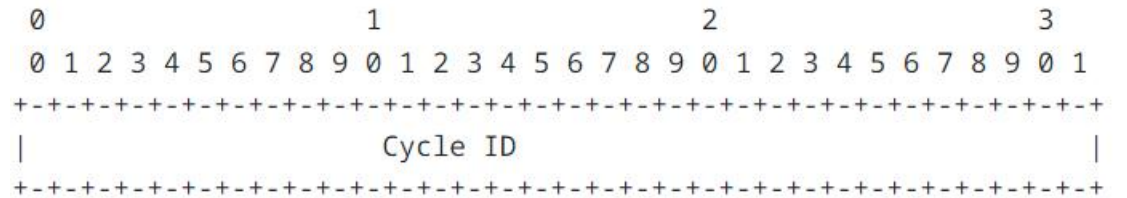


Figure 9 Data Field in Class Level Periodic Bounded Category

Deterministic Latency Option (cont)

- Date Fields in Flow Level Non-periodic Bounded Category
 - As per [I-D.ietf-detnet-dataplane-taxonomy], flow level non-periodic bounded solutions guarantee the minimum and maximum bounds of a packet in a flow or flow aggregate. An example is PIFO [I-D.ietf-detnet-ontime-forwarding].
- Date Fields in Class Level Non-periodic Bounded Category
 - As per [I-D.ietf-detnet-dataplane-taxonomy], class level non-periodic bounded solutions guarantee the minimum and maximum bounds of a packet within a class level. The format is the same with above. An example is gLBF [I-D.ietf-detnet-glb主f].
- Date Fields in Flow Level Rate-based Unbounded Category
 - In flow level rate based unbounded category, the latency bound is primarily influenced by the ratio of a flow's maximum packet size, its allocated service rate and completion time. An example is C-SCORE [I-D.joung-detnet-stateless-fair-queuing].
- Date Fields in Flow Level Rate-based Left-bounded Category
 - In flow level rate based left-bounded category, the latency bound is primarily influenced by the ratio of a flow's maximum packet size, its allocated service rate, start time and completion time. An example is N-SCORE [I-D.ietf-detnet-nscore].

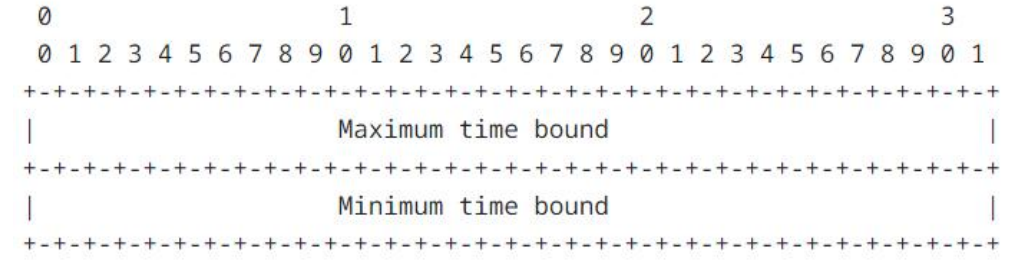


Figure 10 Data Field in Flow Level Non-periodic Bounded Category

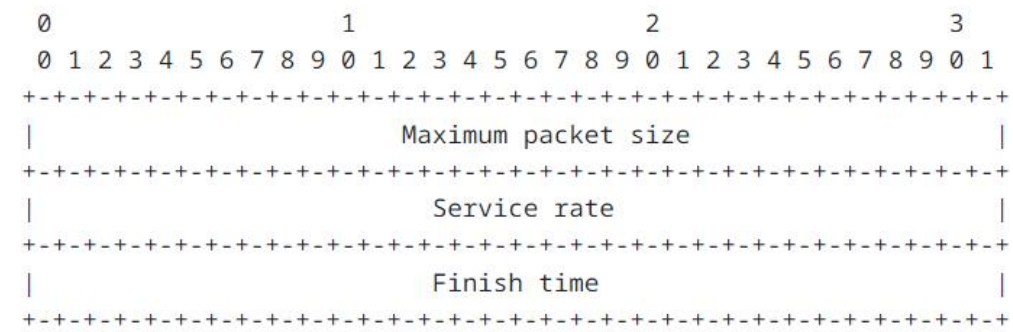


Figure 12 Data Field in Flow Level Rate-based Unbounded Category

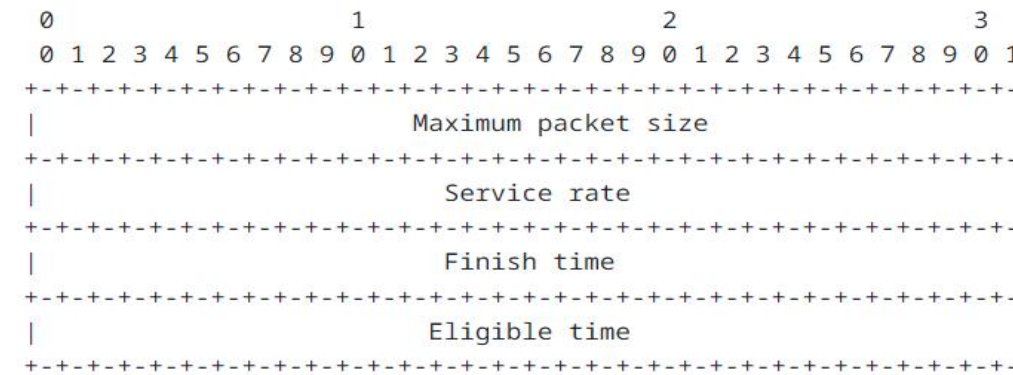


Figure 13 Data Field in Flow Level Rate-based Left-bounded Category

Next Steps

- Follow up the progress of the queuing solutions.
- Comments and Questions are very appreciated!
- Thanks!