draft-eckert-detnet-tcqf-07
draft-eckert-detnet-glbf-04
draft-eckert-detnet-flow-interleaving-03

versus

draft-ietf-detnet-dataplane-taxonomy-04

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Not necessarily speaking for all co-authors of all mentioned drafts

DETNET-WG, IETF123 Madrid

Topic

- Ask at last DETNET interim meeting:
  - Lets try to make progress with draft-ietf-detnet-dataplane-taxonomy by attempting to apply it to your (author) drafts and see how well it works
- Author also of draft-ietf-detnet-dataplane-taxonomy, but here on mike just as WG member and author of the other three draft
  - Aka: would like to exchange thoughts with WG before maybe adding suggested improvements to taxonomy doc
- Not yet added classification to the three drafts

draft-eckert-detnet-tcqf-07

What is it:

enhancement built upon the foundation of Cyclic Queuing and Forwarding (CQF)

Taxonomy

1. Dominant Factor for Latency Bound: Cat 3 (Sum of Max Burst Sizes/Capacity)
2. Periodic solution: Yes

   Significantly increased permissible MTIE (Maxium Time Interval Error) over reference algorithm (CQF). Typically factor 50 ? To support higher speed links without higher accuracy clocks.
3. Traffic Granularity: Class Based
4. Time Bounds: bounded - cycle-time bounded
5. Service Order: (Priority), Arrival

draft-eckert-detnet-glbf-04

What is it:

Asynchronuous damper based forwarding with ATS admission/latency calculus allowing for efficient / lightweight hardware forwarding implementations.

Taxonomy

1. Dominant Factor for Latency Bound: Cat 3 (Sum of Max Burst Sizes/Capacity)
2. Periodic solution: No

   Frequency synchronized, but not phase synchronized clock requirement, synchronization accuracy (e.g. like ethernet +-100ppm).
3. Traffic Granularity: Class Based
4. Time Bounds: bounded - clock (frequency) accuracy proportional.
5. Service Order: Priority, DAMPER ("longest waiting first" ?)

draft-eckert-detnet-flow-interleaving-03

What is it:

Network ingress „packet delay“ mechanism to interleave flow for higher utilization with lower per-hop burst latency – could be built from TAS capable forwarding if available.

Taxonomy

1. Dominant Factor for Latency Bound: Unclear

   Applicable to solutions that are Cat 3 + (tightly) bounded Latency

   The solution reduces the "Sum of Max Burst Sizes" for Cat 3 solutions that are also (strict) bounded by combining (for the purpose of resource management) multiple flow into one flow with higher rate but not higher Burst Size through interleaving of the combined flows bursts to achieve minimum combined "Burst Size".

2. Periodic solution: Yes

   Because this only applies to ingres nodes, it does not extend to per-hop nodes forwarding requirements, it can be e.g.: glbf without changes.

3. Traffic Granularity: Flow Based
4. Time Bounds: bounded - management interval (larger than sum of bursts).
5. Service Order: Unclear

Taxonomy draft issues / improvement suggstions (1)

No classification based on „hop-by-hop“ vs. „ingress-only“

- Important for large-scale networks – different forwarding capabilities on ingress (PE) and per-hop (P).

Traffic granularity

- For the purpose of comparing scalability, we should consider the worst, e.g.: finest granularity requirement.
- Example: section 5.2: 'Therefore, ATS as a whole is "'class level"'. I think ATS should be called an optimized "flow level" mechanism because it still requires per-hop, per-flow state for flow-lookup and timing parameters to calculate packet scheduling. It (only) reduces the per-flow queue/shaper to a per-class queue/shaper - as compared to rfc1122 (Integrated Service).
- Or we could also create a list of the relevant parts of the algorithm, so that the aforementioned "per flow" problemsof e.g.: ATS would not vanish from classification. Would need to define a list of the relevant operations - lookup/calculations, (buffering ?), scheduling ?

5.3 Text suggestion for: "Bounded solutions have strengths to avoid burst accumulation and are also beneficial for jitter control."

- Could also add the benefit of „allowing higher utilization due to interleaving.

Taxonomy draft issues / improvement suggstions (2)

Section 5.4 Service order:

Maybe (better) define that the service order should be specified as a comma separated like of service order types from most significant

Section 5.5

Mentions time based as an option but does not introduce it in its explanation parts.

Section 5.5

Unclear how to characterize Damper based service order. Add as an option (with whatever name) ?.

Section 7

My current thinking is that there are not enough flows to the difference in utilization and latency possible in comparison between solutions that use flow interleaving vs. those that do not.

Maybe: a hundred of low bitrate flows. but i guess the fair approach is for me to propose e.g.: how to change 7.2 with such a flow data set and try at comparison different algorithm approaches.

Questions ?