Cyclic Queuing and Forwarding with tagging for Deterministic Forwarding

draft-eckert-detnet-tcqf-04
Draft work -02 (IETF116) to -03

• Detailed presentation of mechanism from draft-eckert-detnet-tcqf-02 and draft-yizhou-detnet-ipv6-options-for-cqf-variant-01 at DetNet interim
  • Slides, recording see DetNet interim Wiki: https://wiki.ietf.org/en/group/detnet/wmosq
  • David raised question / possibility to merge.

• -03 performed merge of content/authors

• Detailed explanation of evolution from CQF to TCQF
  • CQF model, timing, challenges: buffer ambiguity upon reception
  • Solution with TCQF (tagging of packet), timing, summary of TCQF benefits

• Made forwarding specification independent of encap
  • Separate sections now for (non-exhaustive) encap options:
    • From -02: MPLS/TC, IP/IPv6 with DSCP
    • New IPv6 option header for TCQF “Deterministic IP” (DIP) option via 2 possible extension header alternatives), IANA considerations for it.
Draft independent

• Translation of CENI “Deterministic IP” (DIP = TCQF) high-speed/large-scale network validation test report
  • We used slides from mandarin version in our IETF116 presentation

• Now available with permission from CENI at:

• Also referenced in current draft.
Draft work -03 to -04

• Following presentation of CSQF at DetNet interim
  • Draft-chen-detnet-sr-based-bounded-latency, See Detnet wiki for recording/slides

• Added appendix comparing TCQF/CSQF
  • CSQF moves hop-by-hop cycle mapping to packet metadata (Segment Routing SIDs).
  • Mostly subtle pro/cons for either option – best explored through deployment experience.
  • Any hardware can easily support both TCQF and CSQF.
  • Operator preference will be most important: CSQF is “SR version of TCQF”.
  • CSQF key additional functional benefit (not well quantified yet) in “frame-interleaving”.
    Discussed in new draft. (“better burst management”).

• After another review of CQF in IEEE spec:
  • CQF could support multiple independent instances of cycle buffers
    • selected by e.g.: packet priority.
  • Same could be done in TCQF
  • No evidence that we need this (CSQF for example is simpler), but want to make sure IEEE experts
    understand that – if needed - TCQF solution could support all options that CQF could.
Status / Open issues?

- Draft is quite complete, has received significant review/validation.

- Other desirable DetNet components, such as “gates” would be beneficial in conjunction with TCQF:
  - See draft-eckert-detnet-frame-interleaving

- But should be considered independent from hop-by-hop-forwarding
  - Same as e.g.: PREOF functions are also complementary to hop-by-hop forwarding but kept architecturally separate.