DetNet

Bounded Latency-02

draft-ietf-detnet-bounded-latency-02
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DetNet is about an upper bound on end-to-end latency – not low average latency.

Bounded latency leads to the ability to compute exactly how many buffers are required to achieve zero congestion loss.

Feedback that slows down flows to avoid congestion is not an option for the application space of interest to DetNet.

Mathematically sound assurances can be given on latency and congestion loss.
A reminder - Current status

Intended status: Informational

Content:

3. Timing model
   3.1. Flow creation
   3.2. Relay node model
4. Computing End-to-end Delay Bounds
   4.1. Non-queuing delay bound
   4.2. Queuing delay bound
5. Achieving zero congestion loss
6. Queuing techniques
Major changes from v01 to v02

Idea

• Reduce details referring to IEEE 802.1 TSN scheduling, to make the draft more concise and conformant to DetNet WG.

Changes

• Sec. 5: backlog formula is updated and improved.
• Sec. 6.3 (TAS) and Sec. 6.5 (IntServ): simplified and finalized.
• **Major change** in Sec. 6.6 (CQF): the 2-buffer scheme is consolidated and delay bounds are provided.

TAS: Time-aware Shaper
CQF: Cyclic Queuing and Forwarding

19/11/2020
2-buffer CQF, delay analysis

• Consider a CQF with cycle time $T_c$.

\[ f \]

\[
\begin{align*}
D_1 & \quad D_2 & \quad D_3 & \quad D_4 & \quad D_{k-1} & \quad k \\
1_{\text{CQF}} & \quad 2_{\text{CQF}} & \quad 3_{\text{CQF}} & \quad 4_{\text{CQF}} & \quad (k-1)_{\text{CQF}} & \quad k \\
\end{align*}
\]

$D_i \in [0, 2T_c]$

• End-to-end delay bounds:

\[
D_{e2e}^{\text{max}} = kT_c
\]

\[
D_{e2e}^{\text{min}} = (k - 2)T_c
\]

• End-to-end latency variation:

\[
V_{e2e} = 2T_c
\]
Final steps…

• Final consistency check with the other WG drafts.

• The content of the draft is finalized:
  • Input from the WG is welcome.

• Ask for WG last call.