Title: Track every congestion at any queue in your network

Abstract:

Despite efforts to prevent congestion in data center networks, queue build-up and tail-drop still happen. Many congestion events are micro-bursts, hence are hard to detect, reproduce or debug.

We introduce a P4-based solution that discovers every single queue build-up incidents in the network irrespective of how short it lasts. It collects the identifiers of a stream of packets which experienced a congestion (i.e., queue build-up) along with other important metadata: arrival timestamp, queue id, queue depth. We also capture packets that are tail-dropped from a congested queue and collate them with the other packets that experienced queue build-up. This enables us to reproduce per-packet history of any congested queue and identify victims flows and aggressor flows, which will be visualized in the real-time UI in the demo.

To control the amount of telemetry data while not compromising the granularity of congestion tracking, we program various stateless and stateful filtering & de-duplication logics in P4.

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