Flow Frequency Over Interval Queries

Flow frequency measurements are fundamental in many networking applications such as load balancing, QoS, and network security. We consider a generalized sliding window model that supports frequency and heavy hitters queries over an interval given at query time. This enables drill-down queries, in which the behavior of the network can be examined in finer and finer granularities.

Consider a data stream where each flow has an id (e.g., its 5-tuple):

We address the following problems:

- How many packets has the transmitted between 5PM and 6PM?
- Which flows account for more than 0.1% of the overall traffic at that time?