

Research proposal

Predicting and mitigating microbursts in datacenter networks

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One of the most critical aspects of network traffic is "burstiness," characterized by sudden increases in data volume transmitted over a short period. This bursty nature can create bottlenecks and congestion, leading to degraded network performance. To mitigate the impact of bursts, researchers have developed techniques like traffic shaping, pacing, buffering, and prioritization. However, the recent discovery of "microbursts" in datacenter networks has opened up new research directions in the field. Microbursts are defined as periods of high traffic utilization lasting less than 1 millisecond, posing significant challenges for detection and mitigation. Unlike traditional bursts, current mitigation solutions largely fall short when addressing microbursts, often resulting in substantial packet loss within datacenters.

Therefore, predicting microbursts has emerged as a crucial research direction, and it serves as the core objective of this research project.