

Problem Statement and Use Cases of Adaptive Traffic Data Collection

draft-he-adaptive-collecting-problem-usecases-00

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Motivation and Objective

Motivation

- IP carrier network needs to provide real-time traffic visibility to help network operators
 - quickly and accurately locate network congestion and packet loss
 - make timely path adjustment for deterministic services to avoid congestion
- Persistent sampling at millisecond intervals will generate a considerable amount of data which may claim:
 - too much transport bandwidth resource
 - overload the servers for data collection, storage, and analysis

Objective

- explore the adaptive traffic data collection mechanism so as to capture real-time network state at minimum resource consumption.

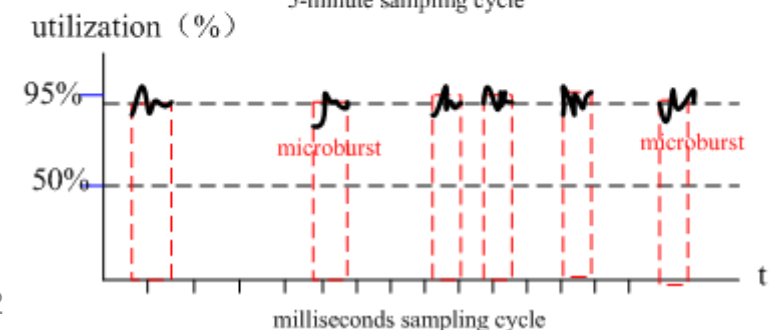
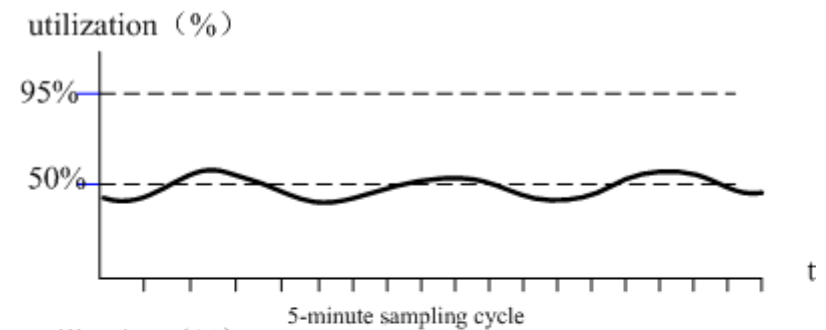
Problem Statement

- IP network is of traffic burst characteristic. But, for a long time, operators have obtained traffic visibility from NMS, which can not reflect this kind of burst characteristic :
 - the observed average network traffic masks the characteristic of traffic burst, given that SNMP is widely employed to collect network traffic at 5 minutes intervals.
 - in spite of low link usage such as 30~40% average bandwidth utilization , many complaints have still been received about poor QoE in delivering applications with the sensitivity of delay and loss.
- A large quantity of operational data indicate that a microburst phenomenon occurs frequently in operator's carrier networks, such as IP RAN, IP metropolitan network, IP backbone network and IDC.
- By means of telemetry techniques, we can capture the complete aspects of a microburst traffic. However, it is impractical to gain the real-time traffic visibility at the cost of persistent sampling at milliseconds intervals.

Scenarios of Adaptive Traffic data collection

Multi-dimensional real-time portrait of interface traffic characteristic □

- obtaining the holistic and genuine characteristic of interface traffic is a basic requirement for the statistical multiplexing model of IP network, which is of great significance for traffic prediction, network planning, network capacity expansion, network optimization, etc.
- under normal non-congested network condition, which happens at the time of 95% above, minutes-level sampling cycle is enough. But, while detecting a congestion state or trend, sampling cycle must be timely tuned to milliseconds to capture a microburst of interface.
- It is essential to exploit the adaptive traffic data collection techniques to depict multi-dimensional real-time portrait of interface traffic characteristic at minimum resource consumption.



Next Steps

- Solicit comments and refine the draft accordingly
- Cooperation are welcome
- Possible implementation and verification