

An intelligent long-lived TCP based on real-time traffic regulation

Mohammad Al Shinwan, Laith Abualigah, Nguyen Dinh Le, Chulsoo Kim, Ahmad M Khasawneh

Transmission control protocol (TCP) transaction is one of the chief protocols of Internet protocols. It is divided into two categories of data flow. (1) A small fraction of the TCP connections carried a small portion of the traffic called short-lived TCP. (2) A small fraction of the remaining TCP connections carried a large portion of the traffic called long-lived TCP. The main problem here is the transmission time; other data usually harm its flows, such as User Datagram Protocol (UDP) or short-lived TCP, and cause the unfairness in the network. In this paper, a novel framework is proposed to improve network throughput and to reduce the impact of long-lived TCP to other data flows. In this framework, each TCP connection passed by an edge network device and it will be observed for determining the long-lived TCP flows. Then, the detected long-lived TCP flow will be regulated based on predicting real-time traffic levels. Moreover, to highlight the benefits of the proposed framework, an analytical model is proposed to compare the proposed framework with the conventional TCP in terms of network performance. Experiments are conducted using the ns-2 benchmark in order to verify the results of the analytical model. The results showed that the analytical outcomes are promising and matched well with the outcomes of the ns-2 experiments. In the case of a high error rate, the proposed framework achieves higher reliability and reveals lower resource consumption.

Al Shinwan, Mohammad, Abualigah, Laith, Le, Nguyen Dinh, Kim, Chulsoo, Khasawneh, Ahmad M., (2020), An intelligent long-lived TCP based on real-time traffic regulation, Multimedia Tools and Applications.