Agile-SD: a Linux-based TCP congestion control algorithm for supporting high-speed and short-distance networks

ABSTRACT

Recently, high-speed and short-distance networks are widely deployed and their necessity is rapidly increasing everyday. This type of networks is used in several network applications; such as Local Area Networks (LAN) and Data Center Networks (DCN). In LANs and DCNs, high-speed and short-distance networks are commonly deployed to connect between computing and storage elements in order to provide rapid services. Indeed, the overall performance of such networks is significantly influenced by the Congestion Control Algorithm (CCA) which suffers from the problem of bandwidth under-utilization, especially if the applied buffer regime is very small. In this paper, a novel loss-based CCA tailored for high-speed and Short-Distance (SD) networks, namely Agile-SD, has been proposed. The main contribution of the proposed CCA is to implement the mechanism of agility factor. Further, intensive simulation experiments have been carried out to evaluate the performance of Agile-SD compared to Compound and Cubic which are the default CCAs of the most commonly used operating systems. The results of the simulation experiments show that the proposed CCA outperforms the compared CCAs in terms of average throughput, loss ratio and fairness, especially when a small buffer is applied. Moreover, Agile-SD shows lower sensitivity to the buffer size change and packet error rate variation which increases its efficiency.