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NF-TCP: A network friendly TCP variant for background delay-insensitive applications.

Domingo-Pascual, Jordi (ed.) et al., NETWORKING 2011. 10th international IFIP TC 6 networking conference, Valencia, Spain, May 9–13, 2011. Proceedings, Part II. Berlin: Springer (ISBN 978-3-642-20797-6/pbk). Lecture Notes in Computer Science 6641, 342-355 (2011).

Summary: Delay-insensitive applications, such as P2P file sharing, generate substantial amounts of traffic and compete with other applications on an equal footing when using TCP. Further, to optimize throughput, such applications typically open multiple connections. This results in unfair and potentially poor service for applications that have stringent performance objectives (including sensitivity to delay and loss). In this paper, we propose NF-TCP, a TCP variant for P2P and similar delay-insensitive applications that can afford to have communication in the "background". NF-TCP aims to be submissive to delay-sensitive applications under congestion. A major component of NF-TCP is to integrate measurement as an integral component of the congestion control framework. This enables the transport to exploit available bandwidth, so that it can aggressively utilize spare capacity. We implemented NF-TCP on Linux and ns-2. Our evaluations of the NF-TCP Linux implementation on ns-2 show that NF-TCP outperforms other network friendly approaches (e.g., LEDBAT, TCP-LP and RAPID). NF-TCP achieves high utilization, fair bandwidth allocation among NF-TCP flows and maintains a small average queue. Our evaluations further demonstrate that with NF-TCP, the available bandwidth can be efficiently utilized.

Keywords: Network-Friendly; submissive; bandwidth-estimation
doi:10.1007/978-3-642-20798-3_26