



Congestion control games

When we surf the Internet, our browser will typically open multiple TCP connections to fetch data from web servers.

The speed at which the browser load a page highly depends on the TCP congestion control mechanism.



Picture taken from [3]

For example, some Content Delivery Networks set the initial congestion window of TCP higher than other CDNs [1]. Some other CDNs will be more drastic and completely replace the congestion control in TCP with a different, more aggressive one, such as Google's BBR [2].

Consider this simple example: one TCP and one UDP flow sharing a bottleneck link. Since TCP slows down when detecting a packet drop and UDP does not, UDP will ultimately get all the available bandwidth while TCP will be starving.

In this project, we aim at understanding what would be the users' strategies to achieve high communication performance when any user is allowed to selfishly tune its own congestion control mechanism.

[1] J. Ruth et al. "Demystifying TCP Initial Window Configurations of Content Distribution Networks". In TMA 2018. http://tma.ifip.org/2018/wp-content/uploads/sites/3/2018/06/tma2018_paper13.pdf

[2] https://en.wikipedia.org/wiki/TCP_congestion_control#TCP_BBR

[3] <https://www.independent.co.uk/topic/black-friday>