Hamilton Institute

Router Buffer Sizing Revisited: The Role of the Output/Input Capacity Ratio

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Abstract

The issue of router buffer sizing is still open and significant. Previous work either considers open-loop traffic or only analyzes persistent TCP flows. Our work differs in two ways. First, it considers the more realistic case of non-persistent TCP flows with heavy-tailed size distribution. Second, instead of only looking at link metrics, we focus on the impact of buffer sizing on TCP performance. Through a combination of test bed experiments, simulation, and analysis,we reach the following conclusions: The output/input capacity ratio at a network link largely determines the drops exponentially with the buffer size and the optimal buffer size is close to zero. Otherwise, if the output/input capacity ratio is lower than one, the loss rate follows a power-law reduction with the buffer size and significant buffering is needed, especially with flows that are mostly in congestion-avoidance. Smaller transfers, which are mostly in slow-start, require significantly smaller buffers. We conclude by revisiting the ongoing debate on "small versus large" buffers from a new perspective.

Biography

Dr. Constantine Dovrolis is an Associate Professor at the College of Computing of the Georgia Institute of Technology. He received the Computer Engineering degree from the Technical University of Crete (Greece) in 1995, the M.S. degree from the University of Rochester in 1996, and the Ph.D. degree from the University of Wisconsin-Madison in 2000. He has held visiting positions at Thomson Research in Paris, Simula in Oslo, and FORTH in Crete. His current research focuses primarily on the evolution of the Internet, intelligent route control mechanisms and performance-aware routing, automated performance problem diagnosis, and applications of network measurement. Dr. Dovrolis has been an editor for the ACM SIGCOMM Computer Communications Review (CCR). He served as the Program co-Chair for PAM'05, IMC'07, and as the General Chair for HotNets'07. He received the National Science Foundation CAREER Award in 2003.

Venue: Seminar Room, Hamilton Institute, Rye Hall, NUI Maynooth

Time: 1.00 - 2.00pm (followed by tea/coffee)

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