

## Near-Optimization and Testing of Index Policies in Internet Routers

**Summary:** The fundamental challenge in computer networks is the one of efficient use of network resources, such as buffers and bandwidth of the routers. Router optimization can be modeled as a queueing model and approached by means of dynamic programming, which usually requires long computational time and therefore it is not implementable. A particular Lagrangian relaxation method leads to a decomposition of the problem into single flows, which can typically be much faster to solve by the so-called Whittle index. This solution leads to a set of priority rules that give a higher priority of buffering and transmission to some flows than to others, which would be dropped if there is no buffer space. The objective of this work will be to compute the Whittle index for different variants of Internet protocols (especially TCP) and test its performance in a router by means of network simulator (ns3).

**Keywords:** Buffer management, Dynamic programming, TCP, ns3

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