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An empirical study of receiver-based AIMD flow-control strategies for CCN

The Content Centric Network (CCNx) protocol introduces a new routing and forwarding paradigm for the waist of the future Internet architecture. Below CCN, a volatile set of transport and flow-control strategies is envisioned, which can match better different service requirements, than current TCP/IP technology does. Although a broad range of possibilities has not been explored yet, there are already several proponents of strategies that come close to TCP's well-known flow control mechanism (timeout-driven, window-based, and AIMD- operated). In this paper, we carry out an empirical exploration of some proposed strategies in order to assert their feasibility and efficiency. Our contributions are twofold: First, we establish if receiver-based, timeout-driven, AIMD operated flow-control on Interest transmissions is sufficiently effective for CCN in a future Internet deployment, where it may co-exist with TCP. In this process we compare the performance of three different variants of this strategy, in presence of multi-homed content in the network (one of them proposed by the authors). Second, we provide indicators for the general efficiency of timeout-based flow-control at the CCN receiver, in presence of in-network caching, and exhibit some of the challenges faced by such strategies.