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Computer Science > Networking and Internet Architecture

Title: A comparative study of aggregate TCP retransmission rates

Authors: [Kostas Pentikousis](#), [Hussein Badr](#), [Asha Andrade](#)

(Submitted on 10 Dec 2011)

Abstract: Segment retransmissions are an essential tool in assuring reliable end-to-end communication in the Internet. Their crucial role in TCP design and operation has been studied extensively, in particular with respect to identifying non-conformant, buggy, or underperforming behaviour. However, TCP segment retransmissions are often overlooked when examining and analyzing large traffic traces. In fact, some have come to believe that retransmissions are a rare oddity, characteristically associated with faulty network paths, which, typically, tend to disappear as networking technology advances and link capacities grow. We find that this may be far from the reality experienced by TCP flows. We quantify aggregate TCP segment retransmission rates using publicly available network traces from six passive monitoring points attached to the egress gateways at large sites. In virtually half of the traces examined we observed aggregate TCP retransmission rates exceeding 1%, and of these, about half again had retransmission rates exceeding 2%. Even for sites with low utilization and high capacity gateway links, retransmission rates of 1%, and sometimes higher, were not uncommon. Our results complement, extend and bring up to date partial and incomplete results in previous work, and show that TCP retransmissions continue to constitute a non-negligible percentage of the overall traffic, despite significant advances across the board in telecommunications technologies and network protocols. The results presented are pertinent to end-to-end protocol designers and evaluators as they provide a range of "realistic" scenarios under which, and a "marker" against which, simulation studies can be configured and calibrated, and future protocols evaluated.

Subjects: Networking and Internet Architecture (cs.NI)

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