A Novel Retransmission Algorithm for Enhancing TCP Vegas Performance

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ABSTRACT

Currently, TCP is the most popular protocol of transport layer used on Internet. It provides a reliable transmission between the source and the destination. When a TCP packet is lost in the network, the traditional TCP will start the congestion control mechanism in spite of why the packet was lost. In fact, there are two possibilities of losing packets: network congestion and link error. If the TCP source misunderstands the possible reason of losing packets, the performance of TCP will degrade deeply. To resolve the degradation of TCP performance, a lot of solutions are proposed. However, most of them focus on the adjustment of congestion window （cwnd）. They did not pay attention to the partial ACK, small cwnd and the loss of retransmission packets problems which result in the TCP source suspends the transmission temporarily. As a result, the TCP still has the performance degradation in the wired-and-wireless hybrid network.

In order to improve the TCP performance in the wired-and- wireless hybrid networks, in this thesis, a retransmission algorithm for TCP Vegas is proposed to solve the partial ACK, small cwnd and the loss of retransmission packets problems. Simulation results show that TCP Vegas with the proposed retransmission algorithm can shorten the suspend time of TCP transmission about 74% than the original TCP Vegas during a 60-second transmission. Furthermore, the proposed algorithm can improve the utilization of bottleneck bandwidth and does not sacrifice the performance of other TCP links which share the same bottleneck link.

Keywords : Congestion control、TCP Vegas、partial ACK、cwnd

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