

Dynamic ACK skipping in TCP with Network Coding for Power Line Communication Network

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Abstract—Transmission Control Protocol (TCP) still plays an essential role in various user applications for end-to-end reliable data transmission. However, TCP cannot get a high goodput performance in the lossy networks because it considers any packet loss to be a congestion signal and decreases the congestion window mistakenly. Therefore, TCP with Network Coding (termed TCP/NC) was proposed to recover the packet loss at the sink without retransmission if the number of coded packets is enough. However, the ACK packet needs to be sent for any arriving coded packet as a feedback of the end-to-end channel condition, resulting in a lower transmission performance in half-duplex networks, e.g., Power Line Communication. Therefore, we propose the ACK-Skipping scheme for TCP/NC to limit the number of ACK packets but still retain the necessary information, e.g., for channel estimation. The simulation result on ns-3 (Network Simulation 3) shows that the proposal achieves a higher goodput on PLC environment compared to TCP with Selective Acknowledgment and TCP Westwood+ as well as the recent variant of TCP/NC.

Keyword—TCP/NC, Network Coding, ACK-Skipping, PLC, Half-duplex, ACK scheduling



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