TCP Congestion Control Scheme for Wireless Networks based on TCP Reserved Field and SNR Ratio

Presented by Hasan Masum(1805052)

Reference

Paper: TCP Congestion Control Scheme for Wireless Networks based on TCP Reserved Field and SNR Ratio

Author: Youssef Bassil,
LACSC – Lebanese Association for Computational Sciences

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Motivation

1. **Solve TCP performance problem** over wireless networks.

2. Allow the TCP protocol to **differentiate between timeouts caused by congestion and those caused by errors and noise in the wireless channel.**

3. Take the right decision in situations where timeouts were due to error and not to congestion, that is **retransmitting** the timed-out packet instead of reducing the congestion window size.

4. Stop the reduction of the burst of the packet and increase packet throughput and transmission speed.

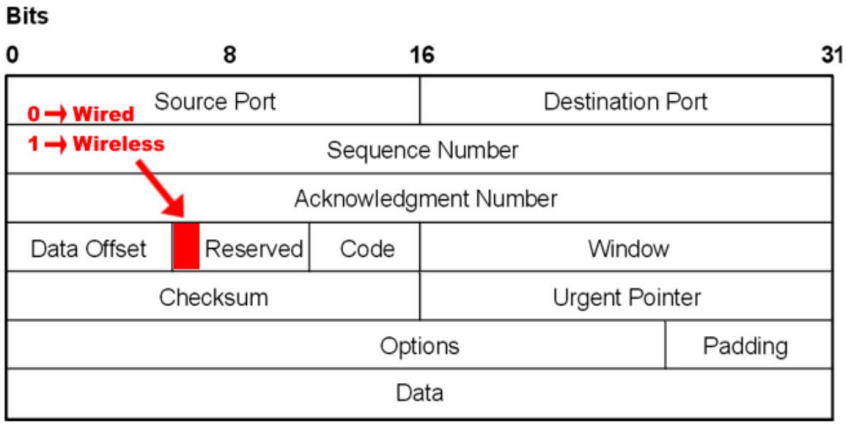
Proposed solution

Reserved bit

Use one single bit of the reserved bits of the TCP header to indicate the type of the link over which connection is established.

- Reserve bit = 0 for wired mode.
- Reserve bit = 1 for wireless mode.

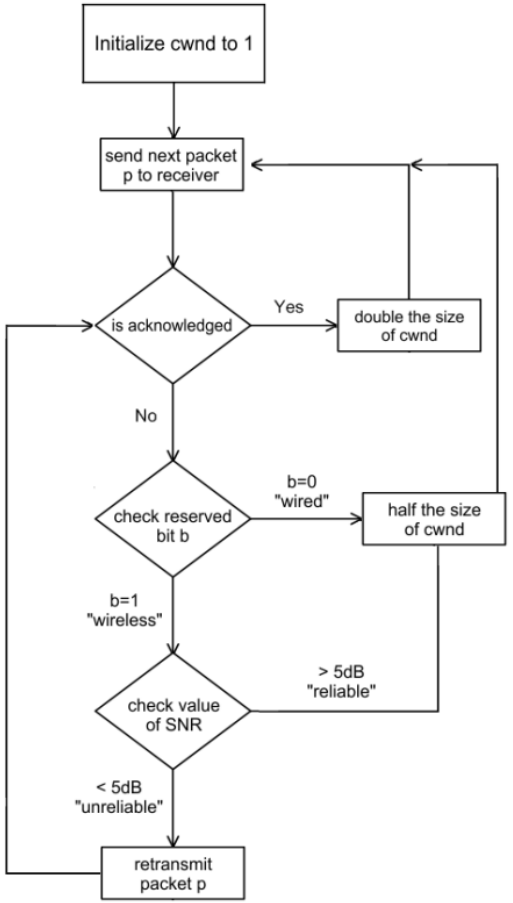
Therefore the proposed algorithm works for both wired and wireless network environments.



Proposed solution

Pseudo-code

1. Initialize congestion window *cwnd* to one segment.
2. Start sending packets to receiver.
3. For each acknowledgement received, increment congestion window *cwnd* by one segment.
4. If a timeout occurs for a particular packet *p* then check the value of the reserved bit *b* for packet *p*.
    1. If *b=0 (wired link)*, then set *cwnd* to half of its previous size (indicating a congestion)
    2. Else if *b=1 (wireless link),* then check the SNR ratio of the link.
        1. If SNR>5dB, then set *cwnd* to half of its previous size (indicating a congestion)
        2. Else if SNR<5dB, then don't change the current size of *cwnd*, and retransmit packet *p* (indicating an error)



Thank you.