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(54) Title: ENHANCEMENT OF EXPLICIT CONGESTION NOTIFICATION (ECN) FOR WIRELESS NETWORK APPLICATIONS

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(57) Abstract: A new and improved Explicit Congestion Notification (ECN) mechanism, and associated method, for wireless and/or mobile network applications to avoid network congestion in a TCP/IP packet-switched network. A method of avoiding congestion in such a network comprises the steps of: transmitting, at a source node, data packets to a destination node, via at least an intermediate node; determining, at the intermediate node, if an incipient congestion is encountered, and if the incipient congestion is encountered, setting a Congestion Experienced (CE) flag in each data packet which indicates the incipient congestion to notify the congestion to the destination node; receiving, at the destination node, a CE data packet, setting an Explicit Congestion Notification-Echo (ECN-Echo) flag in an acknowledgement (ACK) packet subsequent to the CE data packet received, and sending an ECH-Echo ACK packet back to the source node to inform that the congestion was encountered in the network on the path from the source node to the destination node; upon receipt of the ECN-Echo ACK packet, reducing, at the source node, a congestion window and a transmission rate to avoid the congestion, and determining if a packet loss is due to congestion or due to a transmission error, when the incipient congestion is still encountered in the network; if the packet loss is due to congestion, retransmitting, at the source node, only a lost packet to the destination node, via the intermediate node; and if the packet loss is due to the transmission error, re-transmitting, at the source node, the lost packet to the destination node, via the intermediate node, while increasing a round-trip timeout (RTO) but maintaining the same congestion window in order to improve the throughput of connection.