

## Enhancing Throughput for Wireless Multihop Networks

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**Abstract :** Wireless, Multi-hop networks consist of one or more intermediate nodes along the path that receive and forward packets via wireless links. The backpressure algorithm provides throughput optimal routing and scheduling decisions for multi-hop networks with dynamic traffic. Xpress, a cross-layer backpressure architecture was designed to reach the capacity of wireless multi-hop networks and it provides well coordination between layers of network by turning a mesh network into a wireless switch. Transmission over the network is scheduled using a throughput-optimal backpressure algorithm. But this architecture operates much below their capacity due to out-of-order packet delivery and variable packet size. In this paper, we present Xpress-T, a throughput optimal backpressure architecture with TCP support designed to reach maximum throughput of wireless multi-hop networks. Xpress-T operates at the IP layer, and therefore any transport protocol, including TCP, can run on top of Xpress-T. The proposed design not only avoids bottlenecks but also handles out-of-order packet delivery and variable packet size, optimally load-balances traffic across them when needed, improving fairness among competing flows. Our simulation results shows that Xpress-T gives 65% more throughput than Xpress.

**Keywords :** backpressure scheduling and routing, TCP, congestion control, wireless multihop network

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