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Queue Backlog as a Node Metric for RPL Protocol (Conference Paper)

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Abstract

The current de-facto routing **protocol** over WSN developed by IETF Working Group (6LOWPAN) named **as** Routing **Protocol** for Low Power and Lossy networks (**RPL**) [1], to enable IPv6 packets carrying over IEEE 802.4 and to empower the usage of IoT over WSN. Because of the potential large networks, number of nodes and the fact that multiple coexisting applications will be running in the same physical layer, **RPL** in the network layer faces throughput challenges. For the purpose of overcoming these problems many researchers focused on multipath solutions including **a** Back-Pressure routing **protocol** for data collection called BackIP [2], however it shows **a** superior throughput performance, BackIP have shortcomings of higher delay and limited applicability. In this paper, we introduce **a node metric** based on nodes **Queue** Backlogs for **RPL protocol**, which leads to better throughput performance while maintaining the delay and the ability to use with the different network applications. This **metric** depends on the Packet **Queue** length of the nodes with the consideration of other link and **node** metrics, like ETX or Energy usage, leading to better load balancing in the network. Moreover we discuss the needed design changes to enable our **metric** to perform in an efficient way. © 2016 IEEE.

Author keywords

Back Pressure; IOT; Objective Function; **Queue Backlog**; **RPL**; WSN

Indexed keywords

Engineering controlled terms: Low power electronics; Network layers; Queueing theory; Routing protocols; Throughput

Back pressures; Back-pressure routing; Data collection; Network applications; Objective functions; Physical layers; **Queue Backlog**; Throughput performance

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