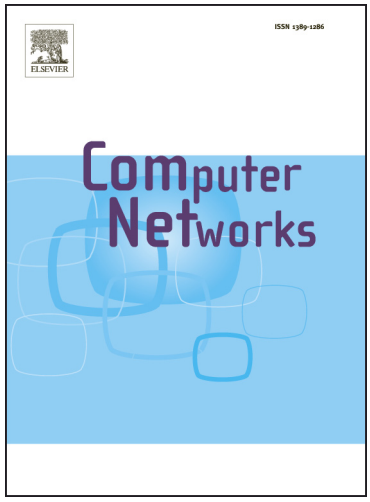

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Congestion Control in Wireless Sensor Networks Through Dynamic Alternative Path Selection

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Abstract

Recent applications on Wireless Sensor Networks (WSNs) demand networks with high and consistent data load. Due to the limited resources of wireless sensor nodes, high data loads can easily lead to congestion conditions. Congestion is a highly undesirable situation since its appearance creates additional overhead to the already heavily loaded environment, which, eventually leads to resource depletion. Thus, congestion control algorithms need to be applied in order to mitigate congestion. In this paper, we present a lightweight congestion control and avoidance scheme, called Dynamic Alternative Path Selection Scheme (DAlPaS). DAlPaS is a very simple but effective scheme that controls congestion while it keeps overhead to the minimum. The operation of this scheme is based on the control of resources instead of controlling the sending rate at the source. The performance of DAlPaS has been evaluated against comparable schemes with promising results.

Keywords: Wireless Sensor Networks, Congestion Control, Alternative Path Routing, Energy Efficiency

1. Introduction

Wireless Sensor Networks (WSNs) are ad-hoc networks composed of wireless sensor nodes capable of sensing various physical phenomena. Wireless sensor nodes are low powered, usually battery powered nodes, and they are frequently deployed in areas where it is difficult to replace or renew their power source. This feature imposes severe constraints in the design of protocols and algorithms for WSNs since they must be lightweight and scalable in order to extent the lifetime