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Congestion control algorithms in wireless sensor networks: Trends and opportunities

Syed Afsar Shah, Babar Nazir *, **Imran Ali Khan**

Department of Computer Science, COMSATS, Abbottabad, Pakistan

Abstract   Congestion control is an extremely important area within wireless sensor networks (WSN), where traffic becomes greater than the aggregated or individual capacity of the underlying channels. Therefore, special considerations are required to develop more sophisticated techniques to avoid, detect, and resolve congestion. The constrained resources of the WSN must be considered while devising such techniques to achieve the maximum throughput. Various approaches have been introduced in the past few years that include routing protocols aided with congestion detection and control mechanism, and dedicated congestion control protocols. In the former schemes, the congestion avoidance is performed by the sink node that causes topology reset and bulk traffic drop. As a consequence, the latter mentioned congestion control protocols addressing the congestion avoidance, detection, and resolution were introduced at the node level. In this paper, we explore mechanisms for controlling congestion in the WSNs and present a comparative study. The congestion control schemes are categorized as centralized with partial congestion control and distributed with dedicated congestion control.

Contents

* Corresponding author.
  E-mail address: babarnazir@ciit.net.pk (B. Nazir).