Mathematical Model for 802.15.4 Networks in NS2: Performance Analysis with BO and SO

International Journal of Computer Applications
Foundation of Computer Science (FCS), NY, USA

Volume 151

Number 5

Year of Publication: 2016

Authors:

Vinamrata, Ajit Anupam, Amit Anupam

Abstract

Network Simulator (NS) is a discrete event simulator targeted at networking research that provides substantial support for simulation of various networks. Performance evaluation in effective manner is the main concern of this paper. This paper, presents a mathematical model to work with the pre-simulation TCL file and post-simulation trace file evaluation for the 802.15.4 networks. The impact of BO and SO on performance of 802.15.4 with varying duty cycle is analyzed considering various parameters like packet delivery ratio, average end-to-end delay and energy consumption in different state: receiving, transmitting and idle mode.

References

1. IEEE 802.15.4, part 15.4: wireless medium access control (MAC) and physical layer (PHY) specifications for low-rate wireless personal area networks (WPANs), IEEE standard for information technology, 2006.
4. AN Alvi, SS Naqvi, SH Bouk, N Javaid, U Qasim, ZA Khan, Evaluation of slotted CSMA/CA of IEEE 802.15.4 (Seventh International Conference on Broadband, Wireless Computing, Communication and Applications., Canada, 2012)
11. Z Xiap, C He, L Jiang, An analytical model for IEEE 802.15.4 with sleep mode based on time-varying queue, in IEEE International Conference on Communications (ICC), Kyoto, Japan, 2011.
19. L-C Ko, Z-T Chou, A Novel Multi-beacon superframe structure with greedy GTS Allocation for IEEE 802.15.4 Wireless PANs. IEEE Wireless Communications and Networking Conference (WCNC), 2007

Index Terms

Computer Science

Networks
Keywords

NS2, MAC, CAP, CFP, GTS, 802.15.4