



Performance Evaluation of Mannasim Framework for Wireless Sensor  
Network in Network Simulator 2

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Performance Evaluation of Mannasim Framework for Wireless Sensor  
Network in Network Simulator 2

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By

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## ABSTRACT

Optimizing sensor networks involves addressing a wide range of issues stemming from limited energy reserves, computation power, communication capabilities, and self-managing sensor nodes. The high cost and difficulties in deploying wireless sensor networks are the main challenges that motivate investigating the performance of a sensor network in a simulated environment. The Network Simulator 2 (ns-2) is one of the flexible tools available for network engineers to study how various protocols perform under different configurations and topologies. ns-2 lacks of modules for studying the sensor networks. However, many researchers have developed several modules for ns-2, which help exploring wireless sensor network before real deployment. This project concerns the reliability of Mannasim module for studying the performance of wireless sensor networks in ns-2. This project supports the analysis of different sensor network configurations under the demands of specific sensor applications. The project showed that Mannasim module is reliable and it is able to meet the requirements of different layers that are involved in sensor networks.

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## CHAPTER ONE

### INTRODUCTION

#### 1.1. INTRODUCTION

Wireless sensor network is a derivative of mobile ad hoc network. According to Garcia (Garcia, 2008), an ad hoc network can be defined as a group of mobile terminals that are independent from any infrastructure, communicating by radio waves, where each of these terminals offers a relay service to accept a message not addressed to it in order to retransmit it to another network terminal, which is out of radio reach of the initial transmitter of this message. An example of an ad hoc network is presented in Figure 1.1.

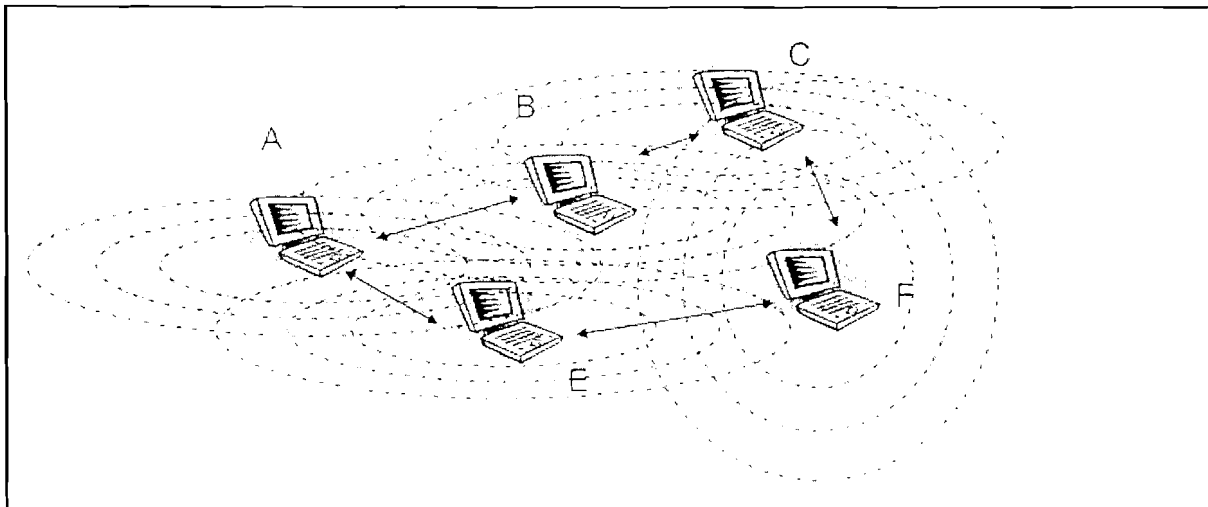


Figure 1.1: Example of an ad hoc network where double arrows show the possibilities of two nodes to establish a bidirectional radio connection (Adopted from (Garcia, 2008))

A wireless sensor network (WSN) is a wireless network of many autonomous low-power, low-cost, and small-size sensor nodes. These nodes are self-organized and use sensors to co-

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the thesis is for  
internal user  
only

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