

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

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UNIVERSITY UTARA MALAYSIA  
2012

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

A Project Submitted to Dean of Awang Had Salleh Graduate School in  
Partial Fulfilment of the requirement for the degree  
Master of Science of Information Technology  
University Utara Malaysia

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.

## ACKNOWLEDGMENTS

Praise to Allah for his guidance and blessing for giving me the strength and perseverance to complete this project. I would like to thank my supervisor Dr Mohammed M Kadhum for his support and encouragement during this project. I have been extremely lucky to have a supervisor who cared so much about my work, and who responded to my questions and queries so promptly. Completing this work would have been all the more difficult were it not for the support and friendship provided by the other members of the School of Computing, Universiti Utara Malaysia. I must express my gratitude to my family who experienced all of the ups and downs of my study abroad. I am indebted to them for their help.

# TABLE OF CONTENTS

## Contents

PERMISSION TO USE .....	i
ABSTRACT.....	ii
ACKNOWLEDGMENTS .....	iii
TABLE OF CONTENTS.....	iv
LIST OF FIGURES .....	vii
LIST OF TABLES.....	viii
CHAPTER ONE.....	1
INTRODUCTION .....	1
1.1. INTRODUCTION .....	1
1.2. PROBLEM STATEMENT.....	2
1.3. PROJECT QUESTIONS.....	3
1.4. PROJECT SCOPE .....	3
1.5. PROJECT OBJECTIVES .....	3
1.6. RESEARCH SIGNIFICANCE.....	4
1.7. ORGANIZATION OF THE PROJECT REPORT .....	4
CHAPTER TWO .....	6
LITERATURE REVIEW .....	6
2.1. BACKGROUND .....	6
2.2. COMPARISON OF MOBILE AD HOC NETWORKS AND SENSOR NETWORKS.....	7
2.3. APPLICATIONS OF WIRELESS SENSOR NETWORKS .....	8
2.4. EVALUATING SENSOR NETWORKS USING SIMULATION .....	9
2.5. NETWORK SIMULATOR 2 (ns-2).....	12
2.6. SENSOR NETWORK EXTENSIONS IN NETWORK SIMULATOR 2 (ns-2).....	15
2.7. RELATED WORK .....	16
2.8. MANNASIM FRAMEWORK .....	17

2.9.	SUMMARY .....	17
CHAPTER THREE .....		19
PROJECT METHODOLOGY.....		19
3.1.	PROJECT STEPS .....	19
3.1.1	<i>Defining problem and objectives</i> .....	20
3.1.2	<i>Reference network model and fixed parameters</i> .....	20
3.1.3	<i>Selecting Performance Metrics</i> .....	20
3.1.4	<i>Selecting Variable Parameters</i> .....	21
3.1.5	<i>Construct Model and Set Fixed Parameters in Software</i> .....	21
3.1.6	<i>Configure Software to Produce Relevant Performance Data</i> .....	22
3.1.7	<i>Execute Simulation and Collect Performance Data</i> .....	22
3.1.8	<i>Present and Interpret Results</i> .....	22
3.2.	NETWORK SIMULATION.....	22
3.2.1	<i>Benefits of Network Simulation</i> .....	23
3.2.2	<i>Network Simulator 2 (ns-2)</i> .....	23
3.3.	SIMULATION SCENARIOS.....	24
3.4.	CONCLUSION.....	25
CHAPTER FOUR.....		26
IMPLEMENTATION AND THE EVALUATION OF THE MANNASIM FRAMEWORK.....		26
4.1.	THE MODEL REQUIREMENTS.....	26
4.2.	TOOL COMMAND LANGUAGE (TCL) SCRIPTS.....	27
4.3.	SIMULATION OUTPUT ANALYSIS .....	32
4.3.1.	<i>Packet Delivery Ratio</i> .....	34
4.3.2.	<i>Routing Load</i> .....	34
4.3.3.	<i>Average End-to- End Delay</i> .....	35
4.4.	SUMMARY.....	36
CHAPTER FIVE .....		37



CONCLUSION AND FUTURE WORK .....	37
5.1. CONCLUSION.....	37
5.2. SUGGESTIONS FOR FUTURE WORK.....	38
REFERENCES .....	40
APPENDIX A.....	44

## LIST OF FIGURES

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)) .....	1
Figure 2.1: Foundation of the sensor network model (Adopted from (Shi et al., 2008)).....	11
Figure 2.2.The available layers and their protocols for wireless sensor networking in ns-2 (Adopted from ((Downard, 2004)).....	13
Figure 3.1: Steps of a systematic simulation study (Mahbub, 2004) .....	19
Figure 4.1: The run of Mannasim simulation with DSR.....	33
Figure 4.2: The run of Mannasim simulation with AODV .....	33
Figure 4.3: Packet Delivery Ratio for WSN when using DSR and AODV .....	34
Figure 4.4: Routing Overhead for WSN when using DSR and AODV .....	35
Figure 4.5: Average End to End Delay for WSN when using DSR and AODV .....	36

## LIST OF TABLES

Table 3.1: Setting parameters for the evaluation scenarios .....	24
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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.

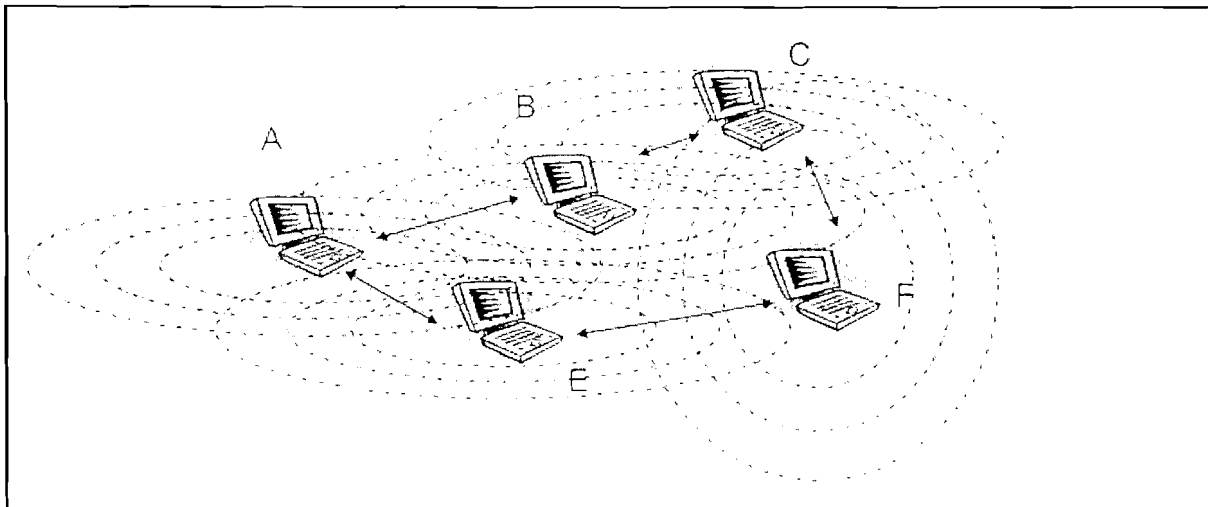


Figure 1.1: Example of an ad hoc network where double arrows show the possibilities of two nodes to establish a bidirectional radio connection (Adopted from (Garcia, 2008))

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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