IMPACT OF NODE MOVEMENT USING DYMO PROTOCOLIN DIFFERENT LANDSCAPE TITLE

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ABSTRACT

Manet is an anthology of mobile nodes with moving sense and can communicate to each other with wireless links without any infrastructure or centralized administration. Manet has to face many challenges in various aspects; one of the further most challenges is terrain size and node placement. In this paper some of the node placement types are analyzed and evaluated their performance. The results are most useful for choosing simulation environment for their particular research and applications which was based on performance of mobile ad-hoc networks

Keywords: *Mobile ad-hoc networks, node placement, scalability, DYMO, QOS*

1. INTRODUCTION

Manet (mobile adhoc networks)[6,8] is a self organizing network which has the capability of movement [mobility]. Manet plays an important role and its advancement is high. Even though high advancement in Manet, it has to face many challenges and difficulties. First and most important aspect of mobile communication is where the communication takes place. Manets can simulate in various forms of terrain types and sizes. Before setting the simulation environment and their nodes type of the terrain that is node placement was considered first. Depending upon the experiment and expectations of simulations, the simulation environment can conclude which terrain type is need for simulation. In this paper the concentration is fully on terrain analysis in their types how the performance varies. Most of the researchers can make use of this paper to setting their simulation environment for their node placement before setting their parameters. This paper deals with three types of terrain node placement [8] as RANDOM, GRID and UNIFORM placements. Discussions are based on both static nodes and mobile nodes. There are two aims for node deployment one is distance based and the other is density based schemes both schemes were deployed. The major troubles is to find a position of nodes such as to, it forms a network that is flexible to all single node failures for communication, it has utmost distance for data collection and it has a minimum number of nodes for cost analysis.
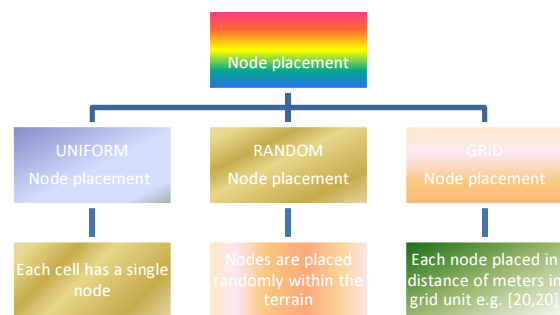
2. NODE PLACEMENT:

Figure 1: Types Of Node Placement And Their Characteristic

2.1. *Types of Node placement*

2.1.1. **R**andom node placement

Random node placement [1, 7] implies, in recreation environment the nodes were set arbitrarily inside the specified territory. The landscape size can additionally be shifting. That is, the amounts of nodes are set arbitrarily inside the physical landscape.

Grid placement:

Grid node position [4, 5] begins from some measurement of arithmetical values (0,0) or (1,1) or (7,7) likewise. At this point the nodes are positioned in grid arrangement where each node has some grid unit similarly numerical qualities; it indicates some separation between every node in meters. The number of nodes is capable in square of the integers like 4, 9 etc.

Uniform placement:

The uniform node position[2,5] is based ahead the number of node position in the terrain. According to the number of nodes the landscape size was separated into a distinct cell and each one cell has a solitary node while the separation between the hubs is to a degree arbitrary yet it has uniform thickness.

3. *SIMULATION ENVIRONMENT:*

The size of the terrain for the first time was 600 m^2 again with the same configuration the experiment was analyzed for 800 m^2 and the network protocol used for this simulation is IPv4 and the transmission range was 15. The simulation was tested for both static and mobility whereas the numbers of events are also noted. The numerical value for Grid node placement was (200, 200). The simulation time was set for 100seconds and the pause time was 30 seconds where the mobility speed was 10mps. Terrain size and the node placement were varied.

The simulation ran for many times, it was observed that each and every time of node placement the nodes were placed in the same place where they are placed as in the first simulation environment. Qualnet simulation tool was used for simulation.

Measurement taken for static mobile nodes

Grid			
600m^2		800m^2	
Throughput	Delay	Throughput	Delay
4180	0.0266	4185	0.0266

Random			
600m^2		800m^2	
Throughpu	Delay	Throughpu	Delay
4260	0.0241	3597	0.05064

Uniform			
600m^2		800m^2	
Throughp	Delay	Throughp	Dela
4274	0.0247	3560	0.0392

Measurement taken for dynamic mobile nodes

Grid			
600m^2		800m^2	
Throughpu	Delay	Throughpu	Delay
4276	0.0188	4276	0.019

Random			
600m^2		800m^2	
Throug	Delay	Throug	Delay
4278	0.0094	3597	0.0508

Uniform			
600m^2		800m^2	
Throughp	Delay	Throughp	Delay
4274	0.0232	4278	0.0178

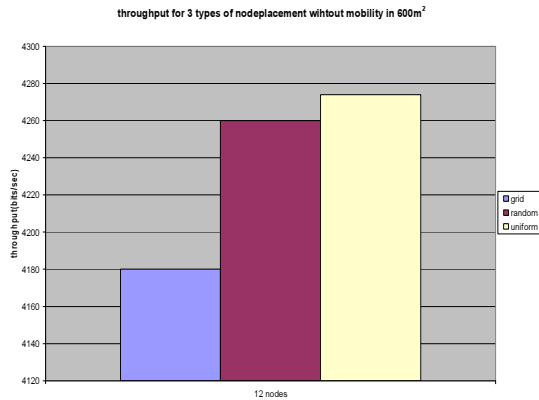*Table 1: Measurement Taken In Variation Of Terrain Sizes For Both Static And Mobile Nodes*
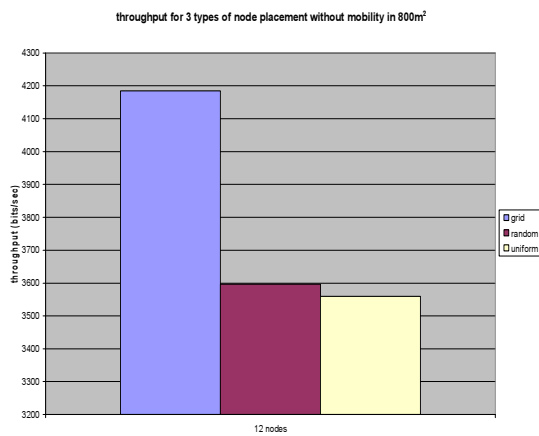
4. ANALYSIS AND RESULTS:

4.1. Throughput Analysis:

4.1.1 Without mobility:
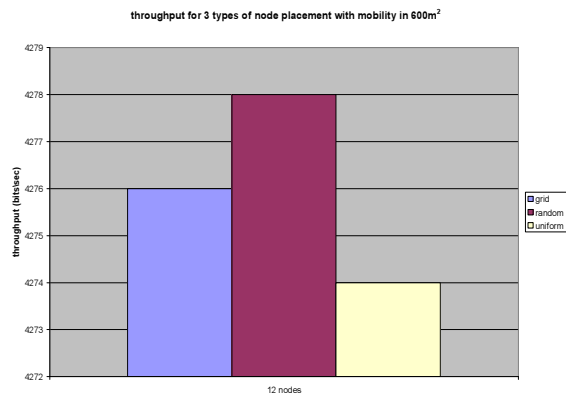
(a) Throughput for 600m^2


(b) Throughput for 800m^2

With the similar design the simulations ran for three types of node positions grid, random and uniform node position respectively. By observing the results the recital of the simulation varied in both conditions of throughput and delay without mobility. Comparing these results it should concluded that random node placement has high throughput in 600m^2 of terrain size. Similarly in 800m^{2}grid has high throughput in the same configuration. These results obtained for static mobile simulations.

4.1.2 With mobility:

In this simulation random waypoint mobility [2] model applied for movement of mobiles for the above configuration. The nodes and various parameters are the same only thing is mobility is added for 600m^2 and 800m^2. By observing it is noticed that the throughput of random node placement was high in 600m^2 terrain size and in 800m^2 terrain size grid node placements has high throughput.
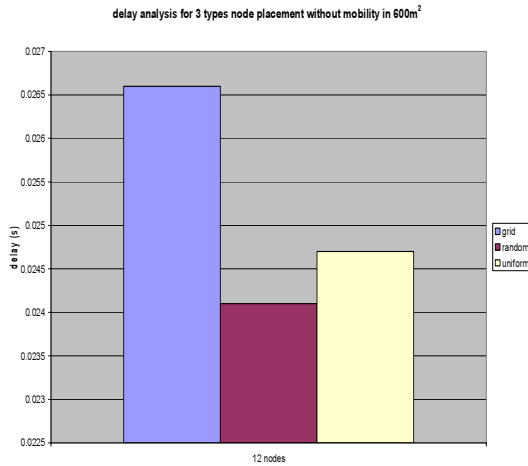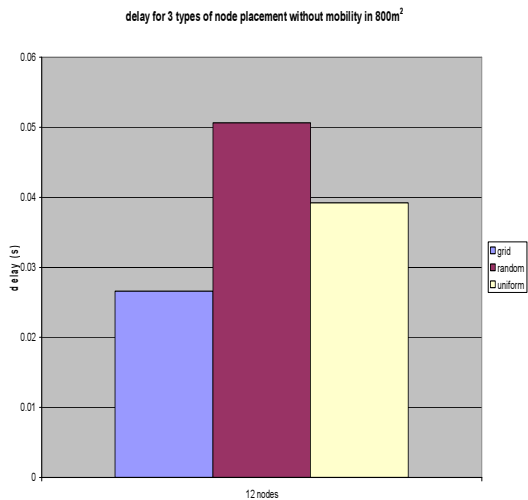
(a) Throughput for 600m^2

(b)Throughput for 800m^2
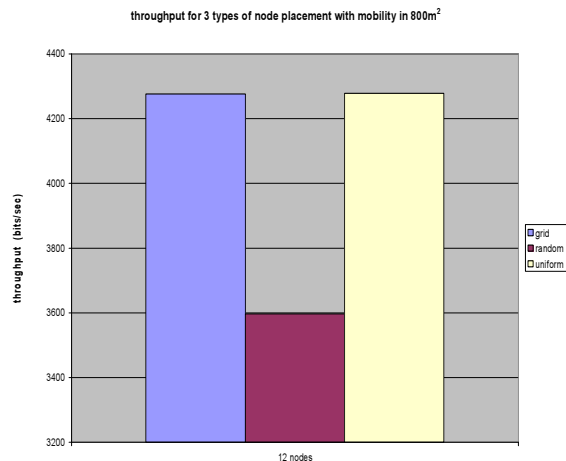
4.2 Delay Analysis:

With mobility:

4.2.1 Without mobility:

(a) Delay for 600m^2

(a) Delay for 600m^2

delay analysis for 3 types node placement without mobility in 600m^2

delay analysis for 3 types of node placement with mobility in 600m^2

(b) Delay for 800m^2

(b)Delay for 800m^2

delay for 3 types of node placement without mobility in 800m^2

delay for 3 types of node placement without mobility in 800m^2
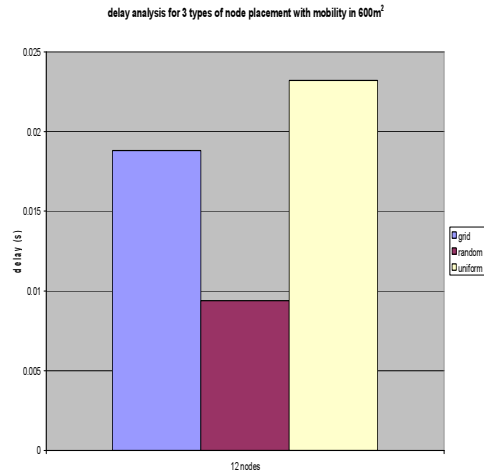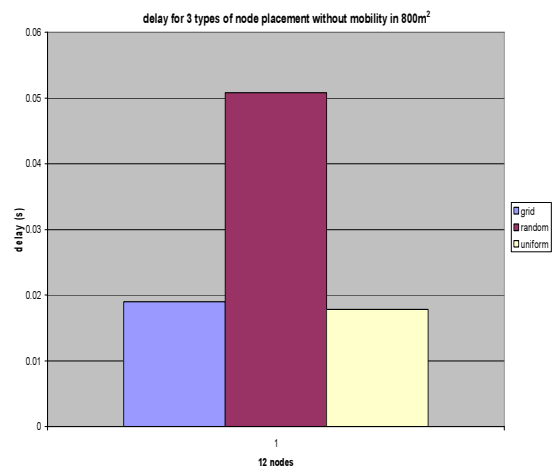
By observing these simulations in 600m^2 grid node placement has high delay and 800 m2 random node placements has high delay in static mobile node simulations without changing the configuration.
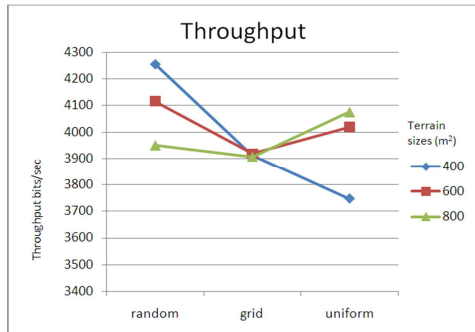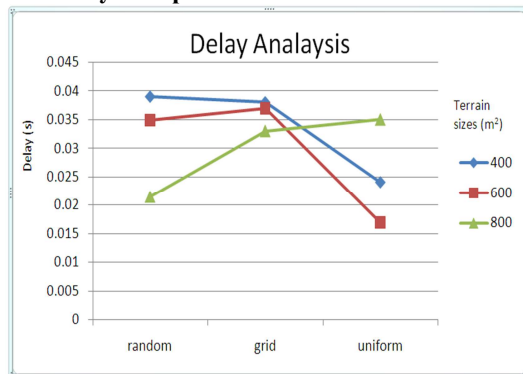
By observing these simulations with mobility in 600m^2 grid uniform placement has high delay and in 800 m^2 random node placement has high delay in static mobile node simulations without changing the configuration. The figure below shows the comparison between random, grid and uniform node placement.

4.3 Throughput Comparison

4.4 Delay Comparison

5   CONCLUSION AND FUTURE WORK:

From these scalability study and simulation experiments we can conclude that making some changes in the terrain size and the type of node placement with same configuration may vary the performance of any type of adhoc network. These analysis will be more useful for researchers in the field of mobile adhoc networks and wireless sensor networks[4] for deploying their nodes in the terrain depends upon their applications and their configuration for reliable and efficient data collection . Further, the future works continue for various parameter measurements with same simulation environment.

REFERENCES:

[1] Marshall, D., D. Delaney, S. McLoone and T. Ward, "REPRESENTING RANDOM TERRAIN ON RESOURCE LIMITED DEVICES, IJIGS/ University of Wolverhampton / EUROSIS

[2] Mohamed Younis· and Kemal Akkaya,"Strategies and techniques for node placement in wireless sensor networks: A survey",*Ad Hoc Networks, Volume 6, Issue 4, June 2008, Pages 621-655*

[3] I.F.Akyildiz,W.Su,Y.Sankarasubramania,E. Cayirci, "Wireless sensor networks: a survey", *Computer Networks*, Vol. 38, pp. 393-422, 2002.

[4] Edoardo S. Biagioni, Galen Sasaki, "Wireless Sensor Placement For Reliable and Efficient Data Collection",EdoardoS. Biagioni, Galen Sasaki, Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS'03) 2002 IEEE[ppt]

[5] *linux.ucla.edu/~gavin/papers/SimulatorManual -3.1.pdf*

[6] Jun-Zhao Sun,"Mobile Ad Hoc Networking: An Essential Technology for Pervasive Computing",MediaTeam, Machine Vision and Media Processing Unit, Infotech Oulu,Finland

[7] A. Boomaranimalany and R.M. Chandrasekaran"A QOS Framework for Mobile Ad-Hoc in Large Scale Networks", Springer , pp.455 – pp.457, September 2010

[8] KavitaTaneja ,R.B.Patel *," An Overview of Mobile Ad hoc Networks:Challenges and Future",M.M. Instt. Of Computer Tech. & Business Management,Deptt. Of Computer Engg. , M.M. Engineering College Mullana, Haryana, India.*

[9] A.BoomaraniMalany and RM. Chandrasekaran ,"Analysing the Data Variation of QOS in Mobile adhoc networks", IEEE 2009