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Load Balancing and Energy Consumption Using Green Computing by Vanet and Manet

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ABSTRACT

Mobile Ad hoc Network applies the principle of Vechicular Ad hoc network. They are the developing field for research and development. VANET's are the subdivision of MANET. In metropolitan areas, the raise of traffic, the ideal use of convenient resources is needed to reduce the energy consumption, In VANET, vechicle communicate between themselves along with roadside appliance site. Therefore, capable protocols are required for this communication. This paper classifies energy consumption and load balancing using green computing by VANET and MANET.

Keywords : Energy Consumption, Load Balancing, Roadside Units.

I. INTRODUCTION

In this type of mobile Ad hoc network(MANET), Vechicular ad hoc network(VANET) that is in wireless communication this allows vechicles to form a self-organisation network, that didn't depend on the existing infrastructure to transmit the data transmit. VANET is an application oriented network, for various real time applications in intelligent transit system (ITS), for example (1,2), (2) transportation capability related application like traffic light control and vechicle navigation (3,4) and (3) entertainment application, A VANET has some derive characteristics like high dynamic topology, periodic connectively and wired network densities in dissimilar typical ad hoc network.This makes that data dissimulation challenging actively in this kind of network.

II. METHODS AND MATERIAL

ALGORITHM OF GREY CORRELATION ANALYSIS:

Grey Correlation Analysis lists the dynamic correlation degree of the system and also the factors which has influence over this system.

There are four concrete steps of implementation which are below,

2.1 The first step is to define the reference number sequence which reflects system behaviour and comparing number sequence which affects system behaviour.

Reference number sequence which reflects reflecting system behaviour that is to choose the best value of one among all influencing factors as the satisfying sample logo or reference number sequence and then select the best value of influencing factors as comparing number sequence.

2.2 Convert the comparing and reference number sequence into dimensions for better comparison factors.

xi (k) = k=1,2,3….n, i=1,2,3…m

2.3 Then the next step is to calculate grey correlation coefficient of reference and comparing number sequence, and find out the minimum and minimum in the grey relational coefficient correlation. Correlation coefficient of x0(k) and xi(k)

LOAD BALANCING AMONG THE NODE

Load balancing technique is the important technique which improves the time of tasks and also manages the energy by reducing all the load imbalances in this Ad hoc network. Co-operative approach is used in the load balancing technique among the network which is usually used for all the nodes having one or more than one incoming requests causing congestion in traffic or high load in that particular node. As this technique called Co-operative approach is used, which shares its workload with its neighbour nodes we can definitely minimize the congestion among the network while the data transfer.

ENERGY CONSUMPTION

The energy consumed by each and every single node for processing purpose is called as energy consumption. K bit of information packet is receiving the sensing element 'i' during consumption of energy which is given by the equation

$$Tx(x,y) = Eene*M + Eamp * d2(x,y) * M \quad (1)$$

Where dij denotes weight between the connected nodes i and j.

One bit energy transmission is spent,the equation is given by

$$etx(d)= pd1+ptd*dn \quad (2)$$

where pd1 denotes dissipate by sending 1 bit data

ptd – power used for transmitting the nodes over a distance.

III. PERFORMANCE ANALYSIS

The performance analysis of this paper is performed in NS2 platform, the following figure denotes the Performance Analysis.

Packet delivery, Delay, Successive transmissions, Packet drop, Throughput, Dropping ratio and Goodput are the parameter used here.

Table 1. Performance analysis compared with MANET and VANET

Parameter	VANET	MANET
Number of nodes	50	50
Initial energy of node	100 J	100 J
Simulation time	150 ms	100 J
Energy consumption	22%	27%
Dropping ratio	7%	9.8%
Packet delivery ratio	94.42%	94.22%
Throughput	67.675%	69.456%
End to end delay	0.333 ms	0.453 ms
Load in each node	2.5 mbps	2.5 mbps

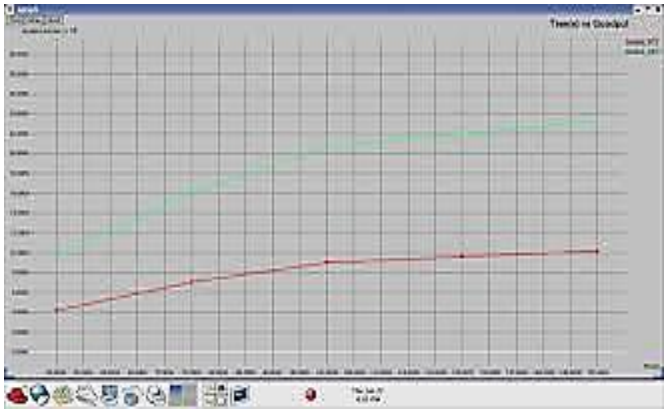

Figure 1 shows the successive transmission is the intensity of successful transmission of packet in the network. It can be measured across time by above algorithm which is simulated in the environment

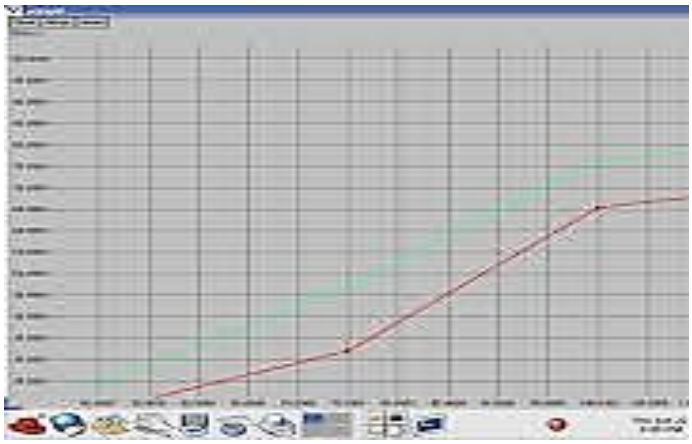

Figure 2 show that the data packet delivery ratio is defined as the number of successfully delivered data packets to the number of data packets generated by the source. Packet Delivery Ratio trace files are post-processed to calculate the delivery ratio of data packets. That is, the relation between sent packets and received packets

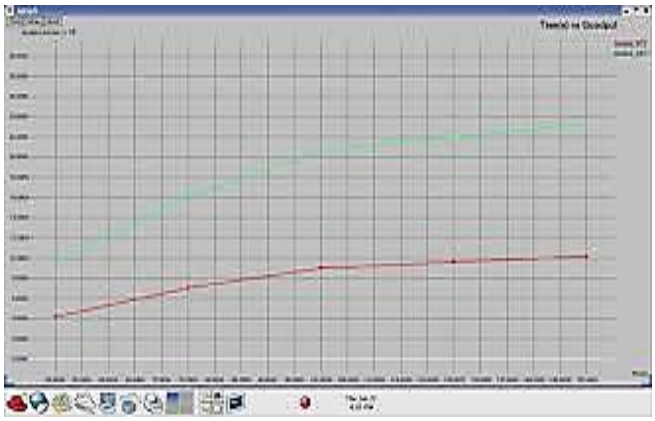

Figure 3 shows the Goodput, i.e. the number of useful information bits, delivered by the network to a certain destination, per unit of time. The amount of data considered excludes protocol overhead bits as well as retransmitted data packets. This is related to the amount of time from the first bit of the first packet is sent (or delivered) until the last bit of the last packet is delivered.

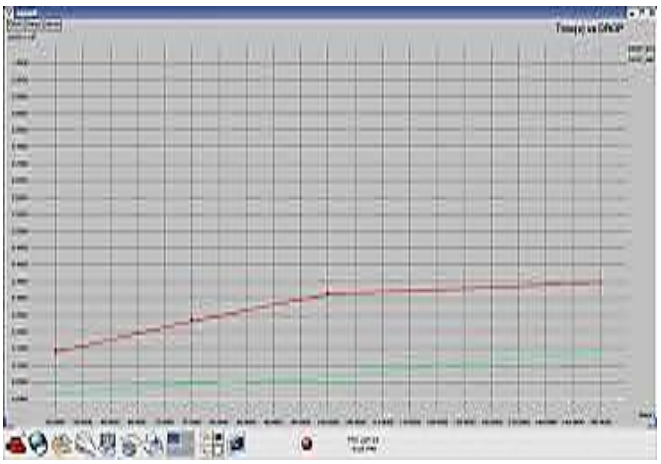

Figure-4 displays the graph for analysis of the packet drop obtained with simulation of the ACO algorithm, suggesting the high reduction in loss of packets with time. Initially the loss of packets is high which in turn reduces with time, thereby increasing the overall efficiency of the suggested ACO algorithm. This proves the conclusion that the reduction in the delay time with increase in efficiency is successfully achieved.

IV.CONCLUSION

Due to dis-communication the communication link is extremely risk in VANET AND MANET. Particle swarm optimization(PSO) and Ant colony Optimization are worked and simulated by using parameters like packet delivery ratio, delay, throughput, Goodput, packet drop and dropping ratio. Due to the tremendous raise in vechicular traffic in urban areas, the correct usage of the available resources is necessary to minimize the load and energy consumption. By minimizing the traffic

among the network we can decrease the drop and as well as the load is balanced at the same time. As a result the lifetime of the network is extended by reducing the load and also the energy consumption, the energy balance among the nodes is must to maintain the smooth data transferring.

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