Queueing Theory based Multi Adapted Routing for Energy Consumption in Wireless Network

S. Nazreen Begum and Dr.S. Bharathidass

Abstract--- Grouping of nodes is one of the most efficient approaches for conserving energy in wireless networks. The multi-event sources in the design of gathering protocols. A Grouping Based Multi-Routing Adapted (GBMRA) formation protocol that aims to save the energy of nodes in the presence of the network. We are introducing the queueing theory based GBMRA for energy consumption in the network. Queueing theory is the proper scheduling for waiting queue lines, or queues. In queueing theory, a model assembled so that queue lengths and waiting time can stand predicted. Queueing theory considered a scheduling for energy consumption because the results often used when grouping decisions about the nodes needed to provide a service in the network. Performance evaluation results show that GBMRA improves the stability and energy conservation of the wireless networks in network commonly estimation of the highest energy level and least hop count also considered. The grouping selection also plays a significant role in finding the optimal path and conserves more energy. We have to take different parameters like as throughput, network delay, energy consumption, network density.

Keywords--- Multi-Routing, Grouping, Scheduling, Energy Consumption, Queueing Theory.

I. INTRODUCTION

Naturally, queueing theory and scheduling are related quantities so by optimizing the latter one implicitly maximizes the former as well. They have consumed all the nodes are free to move in any direction and organize themselves arbitrarily. They can connection or leave the network at any time. Due to the frequent change in the network topology, there is a significant shift in the status of trust among different nodes which adds the complexity to routing among the various multi-routing. They have to implement a proposed model on the network using energy consumption model and better result performance on the system.

The self-organization of nodes in networks may have providing services for the advantage of other nodes to keep their resources model for a new grouping model in the system. The protocols based on a responsive routing scheme, in which at least one route establishedonly when needed. The GBMRA routing algorithm to increasing network performance and reduce delay model on the network.

The main contributions of a mathematical model of queueing theory, global states in the side queueing state keeps invariant, when the scheduling is less than the critical probability threshold, global rulesremains invariant, but is more than significant value, mutations must occur. Therefore, queueing theory is applied to theanalysis of the reasons for network state to energy model on the network.

The wireless network Grouping Based Multi-Routing Adapted method based on percolation theory adapt to topology control theory of the directional antenna, and each node remains built with a directional antenna including the transmit without overlapping each other in the network, that the multi-routing modelis to choose better performance and energy level resources model in the system.The fixed radius design set the same node degree, scheduling algorithms of thewireless network based on theory only send messages in the specific four directions of neighboring nodes so that it

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could reduce energy cost in the procession of thewireless network. It's to more efficient level preprocessing on the network performance to including a data process method.

II. RELATED WORK

An aggressive path collection introduces new exposures and provides the attacker with an improved arsenal of attacks leading to unexpected consequences. They are secondhand for maintaining itself and the rest of the sensor node mechanisms operating over the lengthiest possible periods of time. Multi-class queueing systems are a significant class of queueing systems with multiple types of regulars which may differ in their arrival procedures and service supplies. Such queues are used to model complex schemes, and hence have several critical applications in tele communication, computer, transportation and job shop manufacturing systems. There is an enormous literature in analyzing their performance.

Many problems in wireless communication can be studied using multi-class queueing systems. Examples include a system which serves data calls and a cognitive radio type of scenario with the primary and secondary class of customers.

The queueing intervals are not unavailable into account explicitly, but it is through an identification of the variables of the dual problem with the queue backlogs that queueing delay is implicitly optimized as well. Moreover, due to the quiet environment of the associated optimization problems, the queues' evolution is not taken into account in the optimization.

The energy consumption is mainly due to processing activity since the voltage controlled oscillator is functioning and all circuits are maintained ready to operate. While data generated, energy is consumed by the sensing and processing subsystem only.

In the transmitting mode, energy consumed in the front-end amplifier that supplies the energy for the actual RF transmission, in the transceiver integrated circuit technology and the node processor applying signal generation and handling functions. In the getting mode, energy is consumed entirely by the transceiver electronics and by processing functions, such as demodulation and decoding.

III. PROPOSED SYSTEM

Our proposed system using Grouping Based Multi-Routing Adapted (GBMRA) to consume the energy level processing and data transmission load away from entrance nodes and enables balanced energy consumption across the wireless network.

We developed a new scheme to reduce the energy consumption of nodes during packet transmission.

We develop a queueing model of a grouping based system using M/G/1 queuing model and evaluate the performance of the proposed scheme regarding performance parameters such as average energy consumption and mean delay.

It computes an optimal number of group node such that it decreases the energy consumption using different sub-grouping on the network while providing a high degree of connectivity.

So the networks of queues are systems in which some queues stand connected by multi- routing.

When a multi-routing adapted at one node, it can join another node and queue for service, or leave the network. In our wireless network Multi-routing based scheduling algorithms (also called queueing discipline) have been developed. Each of the Multi-routing scheduling algorithms used internally for these queuing disciplines provides fundamental reordering or dropping of network packets inside various transmit or receive buffers.

Queuing disciplines stand commonly used as attempts to compensate for different networking conditions, like reducing the latency for certain classes of network packets, and usually used as part of the quality of service measures.

A. Multi-Routing based Queueing Model for Energy Consumption

The Multi-Routing queueing model protocol using in wireless networks, GBMRA constructs group to manage with uniform as well as the non-uniform deployment of nodes in the wireless network for scheduling of packet in the network. It uses an application-oriented scheduling algorithm to select various energy level node as a path in the network. Thegrouping protocols focus on the currently available energy of the nodes and periodically reorganize group to do energy balancing in the wireless network.

Algorithm

Step 1: start

Step 2: read Initial energy IE, Scheduling queue sq.

Step 3: receive data RD, neighbor nb.

If (area== RD)

Put nodein to queue

IE=IE+area*nb.

Add node id to scheduling queuesq= (Σnodeid) + IE.

End

If (RD = IE)

Data will be stored using multi-routing.

Then all the information will be received

End

Step 4: Identify node id from scheduling queue and store it.

Step 5: stop.

B. Queueing Discipline for Group Scheduling

The scheduling of the transmission is mainly based on the current state of the energy and also the events occurring in the system.

The nodes which act as a relay for one transmission may be a source node for some other transmission. So to avoid the collision the events occurring in the system, the scheduling procedure remain organized are elected by actually combining the required system parameters with particular energy factors. Every node data transmit based on its available Queueing model.

Algorithm

Step 1: start

Step 2: initialize scheduling IS.

Step 3: read Neighbor group NG, S.No-Sequence no of the packet, N.id –node id, D.id-Destination id

Step 4: create path p message.

Path= {S.no, N.Id, D.Id};

Step 5: for each groupeg from network

If Ø(NGb(i)/NG

The data will be transferred in the network

End.

Step 6: Receive Incoming packet P.

If(P.Type==eg)

{

Established another queue model for data transmission

}

Routenodeeg={P.forwardnode}.

}

Step 7: Identify the complete link from scheduling queue

If path==complete then

Return path.

End

Step 8: stop.

IV. PERFORMANCE ANALYSIS

The Purpose of our reproduction to analyze the presentation of the AODV by using interlocks Networks. The repetition surroundings remain shaped in NS-2, in that provides preserve for wireless networks.

NS-2 was using C++ language, and it has used for an Object Oriented Tool Command Language.

It approached as an extension lead of Tool Command Language (TCL). The executionwas approved out using a wireless environment of 100 wireless nodes rootless over a simulation area of 1200 meters x 1200 meters level gap in service for 10 seconds of reproduction time.

The network grounded data processing or most exclusive and data announcement level on their performance on the network.

Hence, the simulation experiments do not account for the overhead produced when a multicast member leaves a group. Multiple sources create and end sending packets; each data has a uniform size of 512 bytes. Each mobile node to move randomly on their network, it's more and most expectable on their networks.

Parameters	*Value*
Version	Ns-all-in-one 2.28
Area	1200m x 1200m
Broadcast area	250 m
Transfer model	Udp, cbr
Data size	512 bytes

A. Throughput Performance

The ratio of throughput concert overall network performance improve system performance and packet delivery ratio and decrease packet delay.

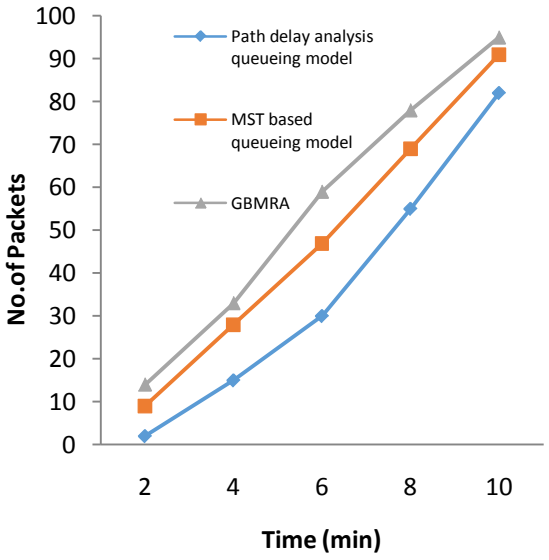

Figure 4.1: Performance of Throughput

B. Delivery Ratio Performance

The packets delivered from source to destination on their network. It is intended by dividing the quantity of data received by ending state finished the volume package originated from starting point on the network. PDF = (Pr/Ps)*100

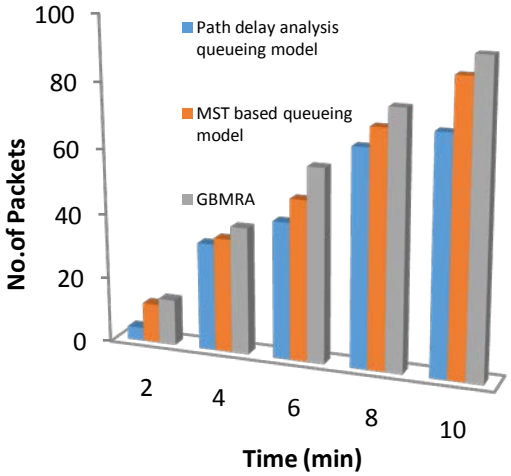

Figure 4.2: Performance of Delivery Ratio

Where Pr is total Data established & Ps is the total data transfer on their network.

C. The End-to-End Delay

They have calculatedan average number of delay on the network; it includes all possible delay caused by buffering through route detection latency, queuing at the border queue, retransmission delay on medium access control, spread and move time.

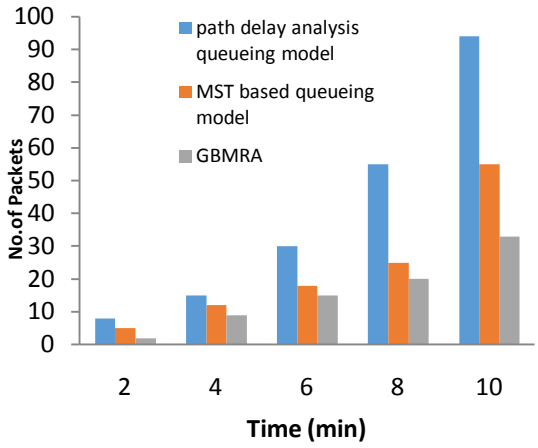

Figure 4.3: Performance of Delay Ratio

That time took a data packet to be crossways a queueing model network from start to ending point on the network.

$$D = (Tr - Ts)$$

Where Tr receives Time and Ts is sent Time.

V. CONCLUSION

In this paper we present Grouping Based Multi-Routing Adapted (GBMRA) protocol in a wireless network using scheduling queue model. The proposed approach associates the neighbor nodes previous before promoting or receiving any packet from its neighbor about its leaving mode so that the neighbor node updates its queueing theory. We have developed an analytical model of a grouping based queuing model and the system performance regarding average energy consumption, and low delay hasbeen determined. We also compare the result of GBMRA and simulation method by using queuing model. Hence it can be concluded that the grouping and simulation methods produce thesame result. By using Queuing theory, we can solve the real world problems.

REFERENCES

[1] F.C. Jiang, D.C. Huang, C.T. Yang and F.Y. Leu, "Lifetime elongation for wireless sensor network using queue-based approaches", The Journal of Supercomputing, Vol. 59, No. 3, Pp. 1312-1335, 2012.

[2] T. Qiu, L. Feng, F. Xia, G. Wu and Y. Zhou, "A Packet Buffer Evaluation Method Exploiting Queueing Theory for Wireless Sensor Networks", Computer Science and Information Systems, Vol. 8, No. 4, Pp. 1027-1049, 2011.

[3] A. Nafees, "Queuing Theory and Its Application: Analysis of the Sales Checkout Operation in ICA Supermarket", Department of Economics and Society University of Dalarna, 2007.

[4] S.K. Sinha, N. Rangaraj and N. Hemachandra, "Pricing surplus server capacity for mean waiting time sensitive customers", European Journal of Operational Research, Vol. 205, No. 1, Pp. 159-171, 2010.

[5] M.K.Gupta,N.Hemachandra and J. Venkateswaran, "On completeness and equivalence of some dynamic priority schemes", IIT Bombay, Tech. Rep, 2014.

[6] Y. Jiang, C.K. Tham and C.C. Ko, "An approximation for waiting time tail probabilities in multiclass systems",IEEE Communications letters, Vol. 5, No. 4, Pp. 175–177, 2001.

[7] A. Asadi and V. Mancuso, "A survey on opportunistic scheduling in wireless communications", IEEE Communications Surveys & Tutorials, Vol. 15, No. 4, Pp. 1671–1688, 2013.

[8] R. Adams, "Active queue management: a survey", IEEE communications surveys & tutorials, Vol. 15, No. 3, Pp. 1425-1476, 2013.

[9] C.F.Chiasserini and E.Magli,"Energy consumption and image quality in wireless video-surveillance networks", 13th IEEE International Symposium on Personal, Indoor and Mobile Radio Communications, , Vol. 5, Pp. 2357-2361, 2002.

[10] T. Qiu, L. Wang, H. Guo, X. Liu, L. Feng and L. Shu, "A new modeling method for vector processor pipeline using queueing network", 5th International ICSTConference on Communications and Networking in China, Pp. 1-6, 2010.

[11] S.A. Khan and S.A. Arshad, "QoS Provisioning Using Hybrid FSO-RF Based Hierarchical Model for Wireless Multimedia Sensor Networks", (IJCSIS) International Journal of Computer Science and Information Security, Vol. 4, No. 1-2, 2009.