New Energy Saving Routing Protocol with Modified Power Consumption Optimization in MANET

Harpreet kaur* and Harminder Kaur**
*Guru Nanak Dev Engineering College, Ludhiana
Harpreetgrewal_88@yahoo.com
** Guru Nanak Dev Engineering College, Ludhiana
Harminder12@yahoo.co.in

Abstract: As wireless technology rapidly increasese during the past decades various detecting and mobility abilities have turned out to be promptly accessible to devices and therefore a number of important tasks are being performed by deployed mobile adhoc networks (MANETs). The vitality effectiveness at individual nodes is the key worry in MANET so because of that a hybrid protocol comarising of LEACH and EPAR i.e. LEPAR is proposed . As opposed to traditional power saving algorithm , LEPAR perceive the point of confinement of node by its residual power of battery, as well as by the normal vitality spent in dependably deliever data packets over a specific connection . The protocol must have the capacity to handle the high portability of nodes which regularly causes alternation in the system topology.The proposed plan diminishes for more than of 10% of the aggregate energy utilization and LEPAR calculation convey the activity in little timeframe and adaptively adjusted the load in the system , furthermore gives better results as far as system lifetime ,one end to other end delay , throughput and jitter.

Keywords: Mobile adhoc network , Low energy Adaptive clustering hierarchy, Efficient power aware routing,Dynamic source routing , Leach efficient Power Aware Routing.

Introduction

"Ref.[1]"Communication now a days has become crucial for trading data between individuals from one spot to any place. In the MANET there is no any settled base station to bolster directing and nodes versatility management. "Ref.[5]" MANET is a gathering of free arbitrarily sent mobile wireless nodes inside of a specific zone. "Ref.[4]" In the cellular systems, The base stations are altered. However, fundamental equipments of these cellular networks are the wireless transmitters and recipients which permit them to communicate with one another without the assistance of any wired base station.
"Ref.[2]"In this manner those versatile networks depend on battery and expanding the lifetime of battery of such devices has turned into a critical point. Since Mobile nodes or gadgets in MANETs are driven by battery , so they experience the ill effects of the issue of restricted energy level. The two noteworthy reasons of connection breakage in the such system :

- Node fatigue due to depletion of vitality
- Movement of node out of the radio scope of other

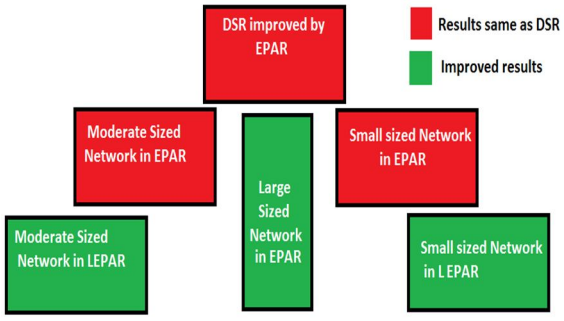
Routing Schemes

"Ref.[9]"Routing is the activity for selection of number of ways in a system . Routing is characterized as the arrangement of guidelines which represents the travel of packets from sourse node to target node. The real objective of any algorithm is to amplify execution of system with least asset use. The execution relies on Throughput , One end to other end time delay, Jitter and the dynamic topology needs two key prerequisites that are algorithm ought to be conveyed and have the capacity to various circle free. There are numerous approaches to arrange the MANET protocols for routing relying upon how the protocols handle the packets to convey from start node to end node.Examplify - Reactive Protocol , Proactive Protocol , Hybrid protocol .

Related Research Work

In the review it is observed that , Improvements are needed basically in the EPAR protocol. DSR protocol consist of route address of source and destination along with intermediate nodes. Therefore , it decrease the throughput and also enhance the packet load of the network. As evident from the base paper and the literature reviews that as an improvement to DSR, EPAR gave 65% better results than original DSR but EPAR algorithm only gives good results in moderate sized networks, gives excellent results in large sized networks but does not give any considerable improvements in comparatively small sized networks. The results revealed are very worrying because most of the networks are either small or Moderate sized. If we want

to implement EPAR in some real time scenarios the Improvement has to be shown in small and moderate sized networks also. This can be done making a hybrid protocol comprising of LEACH and EPAR i.e. LEPAR (Leach efficient Power Aware Routing).



In the previously mentioned respective blocks the procedure of DSR is initially enhanced utilizing EPAR calculation to improve the vitality productive output. With these procedures it is conceivable to upgrade the output of the system in Large expanse systems just however we required the change in all sizes of the systems i.e. in little and modest systems.

LEACH

"Ref.[6]"Low power adaptive group hierarchy is one of the principle group based directing algorithm. . "Ref.[7]"It is most prevalent various leveled directing protocol for wireless sensor systems . "Ref.[3]" LEACH depends on a various leveled grouping structure and energy proficient group based directing protocols for sensor systems. "Ref.[4]" In this directing protocol hubs self-sort out themselves inside a few nearby groups, from which has one hub acting as the group head. Keeping in mind the end goal to drag out the general time period of the sensor systems, Low power adaptive group hierarchy varies group heads sporadically. "Ref.[8]" Low power adaptive group hierarchy has two fundamental steps: the setup stage and the relentless stage. In the set-up stage, two sections are present, the group head choosing part and the group developing part. Afterword the group heads settled down , sensor hubs (that picked as group heads) telecast a commercial message which incorporates their hub ID as the group head ID to advise non-group sensor hubs that the picked sensor hubs are new group heads.

EPAR (Efficient power aware routing) Protocol

"Ref.[1]"With all discussed , it is most clear measurement . For preservation of energy, there ought to downplay the volume of vitality devoured by complete packets navigating from origin hub to target hub i.e. it required the knowledge of the aggregate sum of vitality of the packets expended whenever it goes from each last hub on the path to the following hop. "Ref.[7]"The power devoured for single packet is figured by the formula-

$$P_c = \sum_{a=1}^{x} S\, n_a , n_{a+1}$$

P_c = Power consumed by single packet

S = power devoured in Transmision and Reception a single packet over a single hop.

n_a and n_x = nodes in path

The primary target of EPAR is to playdown the changes in the leftover vitalities of entire nodes and thereby expand the system time period.

Route Revelation and upkeep in the Efficient power aware routimng algorithm

"Ref.[6]"For EPAR, the route is selected in light of energy. First of all, compute the energy of battery for every path that is, the most low hop power of the way. "Ref.[7]" At that point the way is chosen by picking the maximal least hop energy. To examplify, consider the going with circumstance. In this situation two ways have to select. "Ref.[1]" The principle method include three hops with power 24, 20, and 98, and another method contains four hops with energy 42, 28, 48 and 95. Minimal power for the essential way is 20, on the other hand least energy for the other way is 28. Since 28 is more prominent than 20, the 2nd way is picked . Efficient power aware routing protocol is a interest based origin directing protocol that utilize life span of battery. In the Fig.1, DSR chooses the most limited way ABCD or ABFD and MTPR chooses least power route way ABCD. Yet, the EPAR protocol selects AEFD , in light of the fact that that pick way has the

most extraordinary lifespan of the system (1100s). It expands the routing protocol is to amplify the administration lifetime of MANET with element topology. This supports the way which has most extreme lifespan.

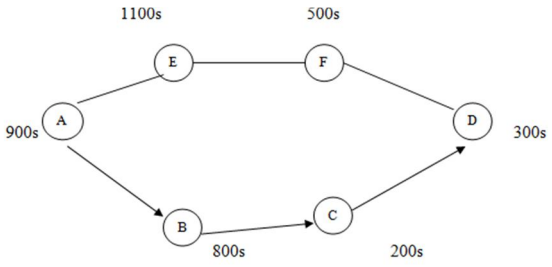


Figure1. Route Revelation and upkeep of the Efficient power aware routing

Simulation Setup and Results Discussion

Performance of different technique has been investigated. To analyze the output, the results of the proposed algorithm have been taken and proposed a hybrid protocol combination of LEACH and EPAR (efficient Power Aware Routing) i.e. LEPAR (Leach efficient Power Aware Routing).

Simulation Results

Simulations were used to analyse and evaluate the capability of proposed algorithm.Comprehensive simulations were conducted using MATLAB R2010a.

Nodes Deployment

The simulated network comprised of 50 nodes arbitrarily dispersed in a 400× 400m zone at the starting of simulation. Different colours of nodes represents clusters.

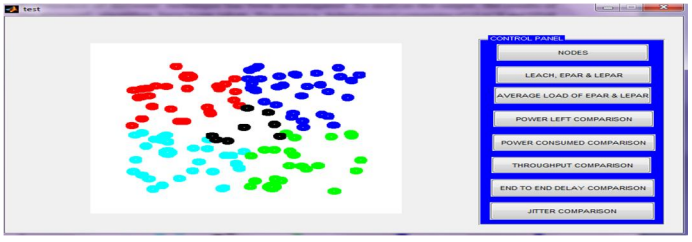


Figure 2. Deployment of nodes

Traffic Distribution

As figure 3 shows that in LEACH a load of ten packets took more time (80 Seconds) to reach at the destination . In EPAR and in LEPAR load is distributed across channels and reached at destination in 20 seconds instead of 80 seconds as showed in figure 4.

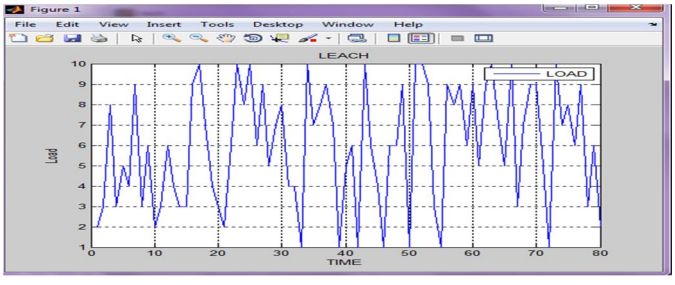


Figure 3. Load of ten packets in LEACH

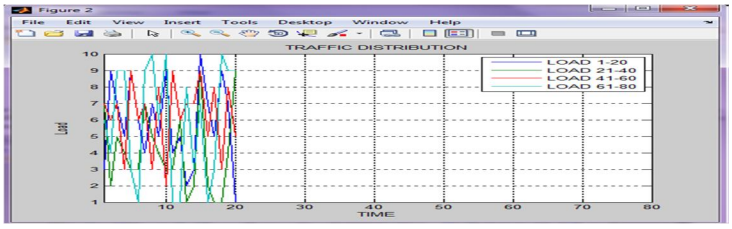


Figure 4. Traffic Distribution

Remaining Power Comparision

Figure 5 demonstrates the aggregate residual power after each round of LEACH, EPAR and LEPAR. The LEPAR algorithm has the overall system lifespan of 9 rounds, where as EPAR and LEACH has the system life of 8 and 7 rounds . This demonstrates our presented algorithm is around 30% and 10% preferable system lifespan over LEACH and EPAR .

Figure5. Power left Comparison between LEACH ,EPAR and LEPAR

One Point To Other point Delay

One point to other point delay is computed by time interval between the first packet transmitted by origin node and recieved at goal node. The mean of one point to other point delay in LEACH is most extreme, in LEPAR it is least and mean in EPAR. Thus LEPAR gives better result than the LEACH and EPAR.

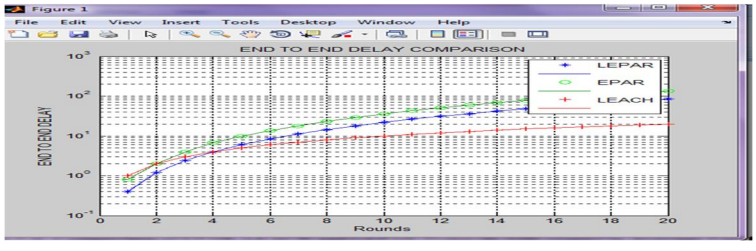


Figure 6. One point to other point delay Comparision

Throughput

LEACH deleivered approximately 30 packets in 20 rounds whereas EPAR deleivered near about 90 packets while LEPAR showed slightly more than 100 packets in same number of rounds which demonstrate that throughput of proposed work is 10% better than EPAR and 60 % than that of LEACH.

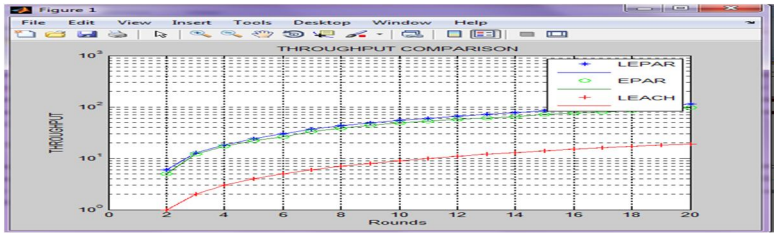


Figure 7. Throughput Comparison between LEACH ,EPAR and LEPAR

Median Jitter(s)

Meadian Jitter is greatest for LEACH , least for LEPAR and normal on account of EPAR. As in a system expanse of 100 nodes , it is discovered that the mean jitter on account of LEPAR gives preferable consequences over the EPAR and LEACH.

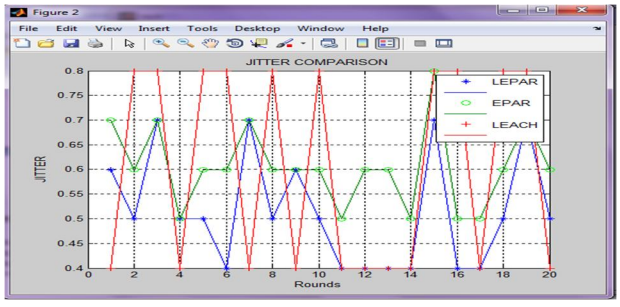


Figure 8. Jitter Comparison

Table 1. Comparison TableFor Different Parameters

	MEADIAN LOAD		POWER CONSUMPTION		THROUGHPUT		ONE POINT TO OTHER POINT DELAY		JITTER	
	load	Time	Power Consumed	Rounds	Throughput	Rounds	OneEnd to other end delay	Rounds	Jitter	Rounds
LEACH	10	20	93	6	110	20	20	20	0.8	8
EPAR	7	20	88	6	100	20	11	20	0.6	8
LEPAR	6	20	86	6	40	20	7	20	0.5	8

Conclusion

In this work , an optimal routing scheme for MANET is proposed. The fundamental conceren was to give without anyobstruction and vitality effective protocol. In this presented plan, LEPAR is utilized as a part of MANETs. In LEPAR, we have evacuated the issues that had discovered in problem formulation. LEPAR as a version to DSR in MANETs enhances the vitality and Quality of service in Moderate and little sized systems.

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