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Power Optimized Secure Routing Protocol in Manet

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Abstract: Power aware is important challenge issue to improve the communication energy efficiency at individual nodes in MANET. We propose here a POS routing protocol for MANET.POS identifies the capacity of the node not only battery power but also the energy spent in reliably forwarding data packet over a specific link .using encryption and decryption process POS creates a key between energy node to secure the message forwarded while creating these two path two parameters are also considered here of energy balance control and security parameter to send message using less energy and full security .these scheme reduces the power consumption , increases the network lifetime and increases the message delivery ratio

Keywords: POS, MANET, OPNET, AODV

I. INTRODUCTION

Communication has become very important for exchanging information between people from, to anywhere at any time. MANET is group of nodes that is connected in lan and help to communicate between nodes. Since those mobile devices are battery operated and extending the battery lifetime has become an important aim. Most of the developers had done research in power optimization but each had led to some problem.

There is always problem of jammer attacks and minimum power or insufficient energy in this the basic reactive protocol AODV is one of the basic reactive routing protocol which has many disadvantages like more delay more energy consumption and less throughput also .after going through all this problems we all have proposed a scheme that will overcome all this issues and we have obtain the good results which have high delivery ratio increased throughput less energy consumption and increased network lifetime

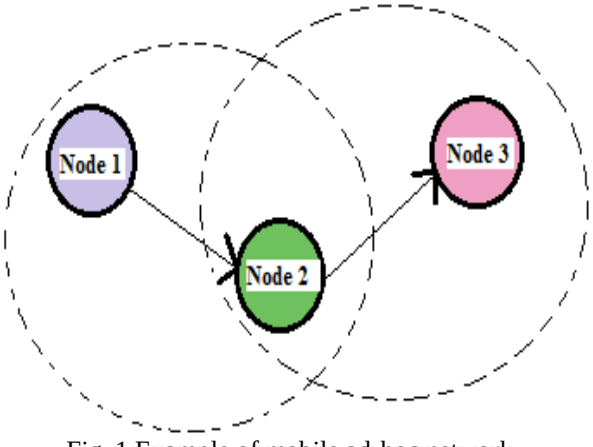

Fig. 1 Example of mobile ad-hoc network

II RELATED WORK

Wireless Sensor Network (WSN) is an emerging technology that shows great promise for various futuristic applications both for mass public and military. We identify the security threats, review proposed security mechanisms for wireless sensor networks.[1]

GPSR scales better in per-router state than shortest-path and ad-hoc routing protocols as the number of network destinations increases.[2]

We describe the rest distributed algorithms for routing that do not require duplication of packets or memory at the nodes and yet guarantee that a packet is delivered to its destination. These algorithms can be extended to yield algorithms for broadcasting and geocasting that do not require packet duplication.[3]

Privacy is becoming one of the major issues that jeopardize the successful deployment of wireless sensor networks.

While confidentiality of the message can be ensured through content encryption, it is much more difficult to adequately address the source-location privacy[4] which performs two shortest path computations to route each message, is superior to previously published heuristics for lifetime maximization– our heuristic results in greater lifetime and its performance is less sensitive to the selection of heuristic parameters[5] this paper we take the view that always using lowest energy paths may not be optimal from the point o

f view of network lifetime and long-term connectivity. To optimize these measures, we propose a new scheme called energy aware routing that uses sub-optimal paths occasionally to provide substantial gains.[6]

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III PROPOSED SYSTEM

Here we have assumed that the network is randomly deployed and each node is having relative location of the adjacent neighboring grid in this POS routing protocol next hop or next node is selected on the basis of energy level and predetermined routing strategy. to achieve energy balance among all grids we carefully monitor that A should only select the grid having more energy for message forwarding for this purpose we have introduce a parameter A[0 1] to enforce the degree of energy balance control. Science energy of every node is defined so there will be no confusion of path it will directly select the grid form A

IV ASSUMPTIONS AND ALGORITHM

A. Algorithm

- 1:-compute the average remaining energy of the adjacent neighboring grids
- 2:- determine the candidate grids for next routing hops
- 3:- send the message to the grid that is closest to the sink node based on its relative location
- 4:- select a random no A
- 5:- if A > B then

Send the message to the grid that is closest to the sink node based on relative location
Else
Route the message to a randomly selected grid in the set
End if.

B. Calculations according to the algorithm
Shortest distance calculations
H = shortest distance between two nodes
h = no of direct hops between DN and SN [1]

$$H = \sqrt[h]{1 + \left(\frac{Pu + Pl}{Pf - Pb}\right)}$$

Pf – Pb
U=upward
D=downward
F=forward
B=backward
P= probability

C. Node hops calculations
Average no of hops needed for message delivery. Where h is required no of hops when security parameter[1]

$$\sqrt[h]{1 + \frac{B}{2(1 - B)}}$$

1-B

D. Average energy consumptions
n = distance between destination node and outermost grid node
i = average energy consumption for the grid with distance i to the destination node[1]
$n^2+n+i-i^2$
2i

E. Steps to be followed for implementation
1) Set the network.
2) Set the encryption and decryption parameters take three values in both encryption and decryption the second and fourth values will contain message to be forwarded so they will have private keys of both and other all values will have path information n id and power filters of all other values so they will share shared key between them.
3) Partition of grids is done based on A and B values either shortest path or random walking.
4) Partition of grid has to be sequence of energy levels the highest energy level will be considered first to forward the message
5) Message will be forwarded by one node in grid but other nodes will have to trace the energy level of other grids nodes
6) After partitioning calculations for selecting nearest node and calculating all the energies of transmitter and receiver depending on the distance between two nodes.
7) Nearest node is selected when A is having its own value between defined one. if it exceeds the value it will choose the secured path for message forwarding
8) When secured path is selected that means B is greater than A so it will select the random path for message forwarding
9) When we stabilize these both parameter we get the stable ratios of delivery, lifetime and throughput
10) After calculations of energy A and B values are applied and graph is plotted

V. RESULTS AND ANALYSIS

Here we have done stimulations using OPNET .we have assumed some values of A and Branging from 0.1 to 0.5 in terms of energy balance control(EBC) and security parameter respectively. We have compared all the values with AODV routing protocol giving same condition and following same algorithm results are shown in graphs.

Analyzing the results we get to see that performance of POS routing protocol is more effective in terms of packets received, delivery fraction and energy consumption. POS routing protocol performance is better in terms of throughput also its 201.40 kbps and AODV its 125.74kbps when alpha and beta has stable values.

A. Stimulation parameters

TABLE 1.

Stimulation area	1103x1091
Mobility model	Random waypoint
Stimulation time	100s
Number of nodes	60
Type of traffic	Constant bit rate (voice)
Packet size	512bytes(4096 bits)
Sending frequency	4 packets/sec
Transmission range	250m
Initial energy	10j

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B. AODV and POS analysis

Here in all the graphs B value that is security parameter B= [0, 0.2] is constant

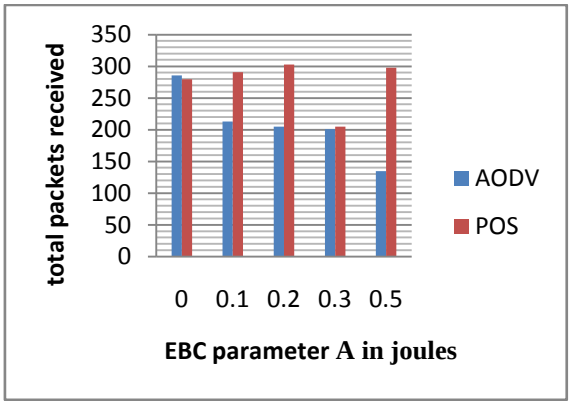

Fig3. Balanced energy versus total messages received

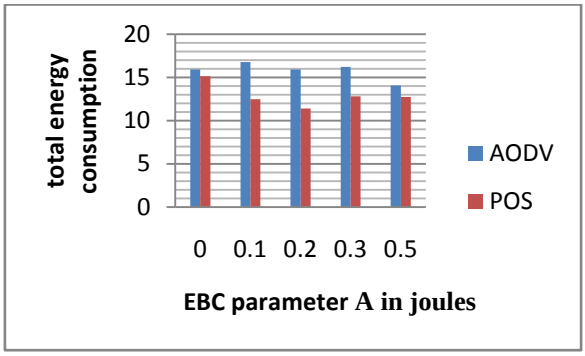

Fig4. Total energy given versus total energy consumed

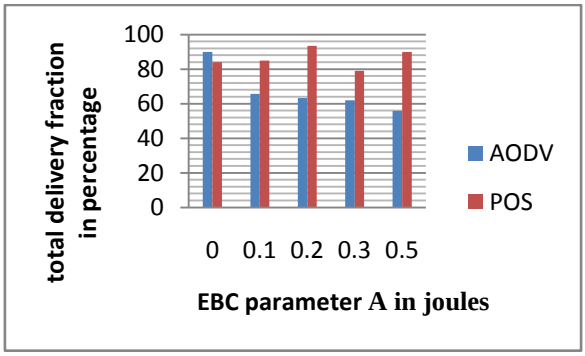

Fig5. Energy balance versus delivery fraction

Optimized value of EBC (energy balance control) and B as security parameter

TABLE II

A=0.5,B=0.25	POS	AODV
packets rec	298	135
delay	0.02	0.04
delivery fraction	90%	41%
energy consumption	12.73	15.92
throughput	201.4	125.74

VI. CONCLUSION

In this paper, we presented a secure and efficient power optimized secure routing (POS) protocol for MANET to balance the energy consumption and increase network security. POS routing protocol has the strategies in message forwarding to extend the lifetime while increasing routing security. Both theoretical analysis and simulation results show that POS routing protocol has an excellent routing performance in terms of energy balance, message delivery fraction and routing path
Distribution for routing path security.

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