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Localization and Non-Localization Node Identification Using Dream in Manet

Amit Singh*, Nitin Mishra and Angad Singh
NRI Institute of Science and Technology, Bhopal, MP – India
*Corresponding Author

Abstract- *A Wireless Mobile Ad-hoc Network consists of variety of mobile nodes that temporally kind a dynamic infrastructure less network. To modify communication between nodes that don't have direct radio contact, every node should operate as a wireless router and potential forward knowledge traffic of behalf of the opposite node. In MANET Localization is a fundamental problem. Current localization algorithm mainly focuses on checking the localizability of a network and/or how to localize as many nodes as possible. It could provide accurate position information foe kind of expanding application. Localization provide information about coverage, deployment, routing, location, services, target tracking and rescue If high mobility among the mobile nodes occurs path failure breaks. Hence the location information cannot be predicted. Here we have proposed a localization based algorithm which will help to provide information about the localized and non-localized nodes in a network. In the proposed approach DREAM protocol and AODV protocol are used to find the localizability of a node in a network. DREAM protocol is a location protocol which helps to find the location of a node in a network whereas AODV is a routing protocol it discover route as and when necessary it does not maintain route from every node to every other. To locate the mobile nodes in a n/w an node identification algorithm is used. With the help of this algorithm localized and non-localized node can be easily detected in respect of radio range. This method helps to improve the performance of a module and minimize the location error and achieves improved performance in the form of UDP packet loss, received packet and transmitted packets, throughput, routing overhead, packet delivery fraction. All the simulation done through the NS-2 module and tested the mobile ad-hoc network.*

Key words: - MANET, Location aware, Energy, DREAM, Routing, Localization.

1. INTRODUCTION:

A network is essentially a group of 2 or a lot of articles that are connected therefore the computers will share resources, like printers, software, and net connections. Networked computers also can share files while not having to transfer knowledge employing a disk or knowledge key. An ad-hoc network can be a assortment of wireless mobile hosts forming a quick network whereas not the assistance of any complete infrastructure or centralized administration. Mobile Ad-hoc networks are self-organizing and self-configuring multi hop wireless networks wherever, the structure of the network changes dynamically. This is often principally as a result of the quality of the nodes. Nodes in these networks utilize an equivalent random access wireless channel, cooperating in an exceedingly friendly manner to participating themselves in multi hop forwarding. The node within the network not solely acts as hosts however conjointly as routers that route knowledge to/from alternative nodes in network.

In mobile ad-hoc networks there\'s no infrastructure support as is that the case with wireless networks, and since a destination node can be out of vary of a supply node transmission packets; a routine procedure is usually required to seek out a path thus on forward the packets suitably between the supply and therefore the destination. Within the case of ad-hoc networks, every node should be ready to forward knowledge for alternative nodes. This paper focuses on the localization techniques to identify node location. Several researches are going on in the field of localization to identify the exact location. The location of the nodes plays a significant role in many areas as routing, surveillance and monitoring, military etc. Localization of a sensor node is carried out with the help of neighbouring nodes. The localization techniques can be grouped into two types namely range based and range free approach.

A. Range based approach

This method uses the range information to calculate the distance between each node. The localization can be carried out with or without the anchor nodes

B. Range free approach

There are few localization techniques that do not require special hardware for localization.

i. Using anchor nodes

While deploying the sensor network, few are manually configured their location reference either manually or using GPS. These nodes act as the anchor nodes. Other nodes localize themselves with the support of anchor nodes.

ii. Without using anchor nodes

A device that has GPS attached need not require a support from anchor nodes for localization. The assistance of satellites is required for finding out the location of the sensor node that has GPS device.

2. RELATED WORK:

There are various previous work have been done in the field of Location Awareness with the help of Efficient routing protocol, for the improvement of various localization efficient techniques. This will help in routing packet from source to destination in network.

In this paper [1] Localization is associate degree sanctionative technique for several sensing element network applications. Real-world deployments demonstrate that, in observe, a network isn't continuously entirely localizable, deed a definite range of in theory non-localizable nodes. Previous studies in the main specialize in the way to tune network settings to create a network localizable. However, the present ways ar thought-about to be coarse-grained, since they equally traumatize localizable and non-localizable nodes. Ignoring localizability induces extra changes and incidental prices. During this study, we tend to propose a fine-grained approach, localizability-aided localization (LAL) that essentially consists of 3 phases: node localizability testing, structure analysis, and network adjustment. LAL triggers one spherical adjustment, once that some widespread localization ways are often with success applied .Being attentive to node localizability, all network changes created by LAL ar purposefully chosen. Experiment and simulation results show that LAL effectively guides the adjustment whereas makes it economical in terms of the amount of additional edges and affected nodes.

In this paper, we tend to compare the performance of various protocols for unexpected networks [2] Multipath routing supported Fresnel zone routing (FZR), and Energy aware Node Disjoint Multipath Routing (ENDMR) protocol. Simulation results show that, with the proposed network coding in ad hoc network multipath routing protocol (NC-MR), packet delivery magnitude relation, network period and packet loss will be improved in most of cases. it's associate accessible approach to multipath routing call.

H. Vijayakumar , M. Ravichandran EELAR [3] utilizes location info of mobile nodes with the goal of decreasing routing-related overhead in mobile and unexpected networks. It uses location info of the mobile nodes to limit the explore for a replacement route to a smaller space of the unexpected network which ends during a important reduction within the range of routing messages and so the energy consumption of the mobile nodes batteries decreased significantly.

The proposed scheme [4] controls the transmission power of a node in keeping with the gap between the nodes. It conjointly includes energy info on route request packet and selects the energy economical path to route information packets. LAR1 protocol uses location info of a node for setting the trial from supply to destination. We have a tendency to take this feature of LAR1 as a key think about planning of variable vary technique. The most aim is to style a method of variable transmission power management to scale back overall energy consumption of the network. RREQ in LAR1 protocol consists of supply location and destination location info. We've used this info to calculate the gap between the nodes. We have a tendency to conjointly insert the energy issue of the node in RREQ packet for choice of energy economical path.

In this paper [5] proposed a new protocol that consider in both areas of routing and energy. At first, propose a more efficient routing method which minimizes the spread of unnecessary control message. Secondly, Associate in energy aware methodology is projected to pick out correct transmission power by the space between nodes. This system is created to supply economical routing by minimizing the flooding of unnecessary control message, considering restricted energy of mobile node and exploitation applicable transfer power to communication and eventually, we have a tendency to create a replacement perform to pick out next hop that considers each of distance and energy. The result of simulation shows that performance of period is improved concerning twelve percent when put next with LAR.

ParizaKamboj and Ashok.K.Sharma,[6] gives the concept of local connectivity technique and preventive route reconfiguration on the basis of the current status of the nodes are being proposed that attempts to improve the performance and reliability in terms of reduced overhead, power and bandwidth requirement. These techniques also ensure good reduction in latency in case of link breakages and prevention of the network from splitting. The Energy Efficient Routing Multicast Protocol for MANET with Minimum Control Overhead is compared with other shared tree multicast protocol i.e. MAODV. Comparison was made on various parameters like Energy Consumption, Packet Delivery Ratio, Delay,and Throughput.

A mobile unexpected network (MANET) [7] consists of autonomous mobile nodes, every of that communicates directly with the nodes at intervals its wireless vary or indirectly with alternative nodes

during a network. so as to facilitate secure and reliable communication at intervals within a MANET, an efficient routing protocol is required to discover routes between mobile nodes. the sector of MNAETs is quickly growing attributable to the numerous benefits and completely different application areas. Energy potency and Securities ar some challenges long-faced in MANETs, particularly in planning a routing protocol. during this paper, we have a tendency to surveyed variety of energy economical routing protocols and secure routing protocols. In several cases, it's tough to match these protocols with one another directly since every protocol contains a completely different goal with different assumptions and employs mechanisms to attain the goal. per the study, these protocols have completely different strengths and downsides. A protocol will hardly satisfy all necessities. In alternative words, one routing protocol can not be an answer for all energy economical and security problems that ar long-faced in MANETs, however rather every protocol is intended to supply the most doable necessities, per bound needed eventualities.

We have projected a node-disjoint multipath routing protocol GMR [8] with the cluster quality model. The GMR protocol adopts intra-group routing and inter-group routing to adapt 2 situations: within a group and among groups. Intra-group routing uses a proactive methodology that is appropriate for the intragroup where nodes have the same mobile pattern. Intergroup routing uses a reactive methodology with the division methodology,that is accommodative to the dynamic topology, and limits the region of broadcasting RREQ packets. Thus, the GMR protocol has sensible quantifiable in massive and dense MANET.

In this paper [9] we tend to, analyse the limitation of previous works and propose a unique idea of node localizability. By derivation the required and ample conditions for node localizability, for the primary time, it's potential to research what number nodes one will expect to find in sparsely or moderately connected networks. To validate this style, we tend to implement our answer on a real-world system and therefore the experimental results show that node localizability provides helpful tips for network readying and alternative location-based services.

Location Prediction based Routing Protocol [10] doesn't need the periodic broadcast of beacons within the neighbourhood and it assumes nodes ar position aware and also the clocks across all nodes ar synchronous . In LPBR [3], every node forwards the Route-Request packet when incorporating all the relevant parameters. The destination node collects the placement update vector info of all the nodes within the network from the RREQ packets and sends a Route-Reply packet to the supply on the minimum hop. In LPBR [3] the supply node uses the route learnt through the most recent LPBR-RREP packet to send the info packets. If associate intermediate node couldn't forward the LPBR-RREP packet, it sends a LPBRRREP-ERROR packet to the destination informing the failure. The destination node discards all the relevant info and also the supply initiates succeeding flooding primarily based route discovery when temporal order out for the LPBRRREP packet.

This paper proposes a new MANET routing algorithm [11] that includes quadrant based opportunistic routing, an intelligent energy matrix and energy status request messages with packet receipt acknowledgement notification. The proposed algorithm uses an intelligent energy matrix that creates a look up table including the key characteristics: reputation value, residual battery level and energy consumption. The proposed algorithm balances the traffic uniformly across four Intermediate nodes in any desired quadrant. The simulation results given during this paper demonstrate that owing to the inclusion of the energy matrix and quadrant based mostly routing, the quantity of broadcast messages decreases, reducing knowledge flooding, providing improved channel potency and improves information measure utilization. Load levelling additionally will increase the life of intermediate nodes that provides improved route stability.

Location Aided Knowledge Extraction Routing Protocol [12] uses an on demand request-reply mechanism in route discovery. LAKER gradually discovers knowledge of topological characteristics such as population density distribution of the network. It is based on a set of guiding routes, which includes a chain of important positions between a pair of source and destination locations. LAKER is especially suitable for mobility models where nodes are not uniformly distributed**.**

3. LOCATION BASED DREAM:

A location based mostly routing protocol that uses the situation info hold on among the routing table of every node, for all alternative nodes among the network. The situation based mostly protocol specifically thought of here is that the Distance Routing result formula for quality or DREAM. The DREAM protocol may be thought of proactive within the sense that a mechanism is outlined for the dissemination and change of location info. once the sender node S must send a message to the destination node D, it uses the situation info for D

to get D's direction, and transmits the message to all or any its one hop neighbours within the direction of D. the following nodes repeat constant procedure till the destination node is reached. This effectively leads to employing a reactive approach, as individual nodes within the path verify subsequent hop in AN on-demand manner. Within the DREAM formula, every node participates within the transmission of management messages containing the present location of a selected node to all or any alternative nodes among the network, within the variety of Location Update messages. The frequency of such updates is set by the gap issue and quality rate of every node. The improvement projected among this thesis introduces the direction of travel info of the actual node additionally to the situation and time info, among the situation update message. This permits the sender node S to calculate the direction of the destination node D with a larger accuracy. This may conjointly make sure that a lesser range of next-hop neighbours area unit chosen once an information packet is shipped, effectively reducing the overhead caused by the cooperative mechanism inherent to a Ad hoc network

4. PROPOSED WORK:

Here we tend to style the algorithmic program for location aware with AODV for destination location estimation, here terribly 1st we tend to produce mobile node and so set all parameter like routing protocol as AODV and so broadcast the routing packet, that point we tend to check next hop data like next neighbour node if next node is found therefore we tend to add this node into the routing table and send routing packet until the destination reach condition through higher than mechanism if destination found then destination node reply through routing acknowledgement packet with their location data to the supply node, and at the moment sender node send's actual knowledge packet to the destination. however some time some intermediate node move attributable to quality nature and existing route break down so case we tend to apply DREAM module and minimize routing overhead of the network that additionally minimize numerous performance analysis as compare to alternative existing routing protocol.

PROPOSED ALGORITHM:

LOCALIZED NODE IDENTIFICATION ALGORITHM: (LNI)

INPUT INITIALIZATION:

No. of nodes = Nn // Total mobile nodes in a n/w

Localized node = Ln

Non-Localized node = Un

Routing Protocol = AODV

Location Protocol = DREAM

Sender node = S ϵ Nn

Receiver node = R ϵ Nn

Intermediate node = I ϵ Nn

Start Simulation time = to

End Simulation time = tn

Radio Range = Rr(500m) // Initialize radio range

S – Broadcast – (Route (S, R, Rr))

If (I in range && I! = R) **then**

I ← Receives routing packet

I ← Creates routing table

Forward (I, R); **end if**

Else if (next hop = = R) then

R ← Receives routing packet

R ← Creates routing table

R ← Sends ACK to S

Call DREAM (Location , speed , Node_ id);

End if

else

Receiver not found

DREAM (Location , speed ,Node_id)

If route established from S to R then

Create Zone: 500m;

While (Nn in range) do

Nn- speed ← Speed(n)

Nn- Location ← Location (n);

Nn-id ← Id(n);

DREAM – Broadcast – (Location, Speed , Nn_ id , S)

S – Receives packet ← Receive (Location, Speed, Nn_id)

End do

End if

While (Route break from S to R) do

S ← Creates expected zone based on sender receiver packet

S Broadcast with sender receiver packet

R ← found;

Re-establish route from S to R;

Send data (S , R , packet type);

End do

5 .SIMULATION ENVIRONMENT:

Network Simulator (Version 2), widely known as NS2 [32] is simply an event driven simulation tool

Parameters	
Simulator Used	NS-2.31
Number of nodes	50
Dimension of simulation Area	800×800
Routing Protocol	AODV
Location protocol	DREAM
Simulation time	100sec
Traffic connection	TCP/UDP
Packet size	512 bytes
Transmission Range	500m

that has proved useful in studying the dynamic nature of communication networks. Simulation of wired as well as wireless network functions and protocols (e.g., routing algorithms, TCP, UDP) can be done using NS2.

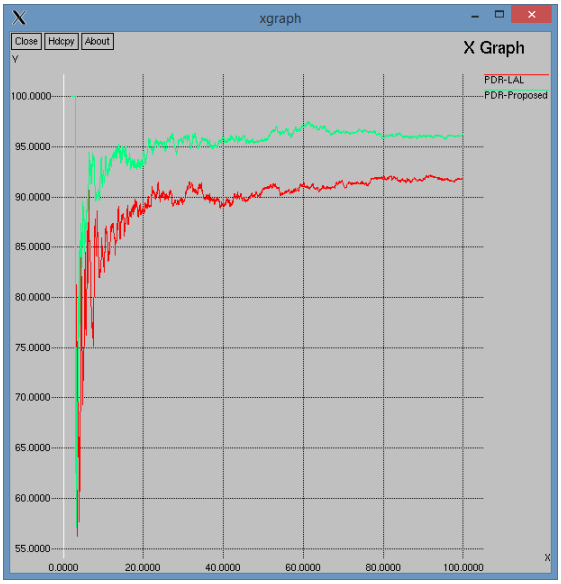
The AODV (Ad-Hoc On-Demand Distance Vector) routing protocol is a reactive routing protocol. Routes are established on-demand, as they are needed. DREAM is an ad hoc location-based routing protocol which helps in finding the location of node in a network.

6. RESULTS:

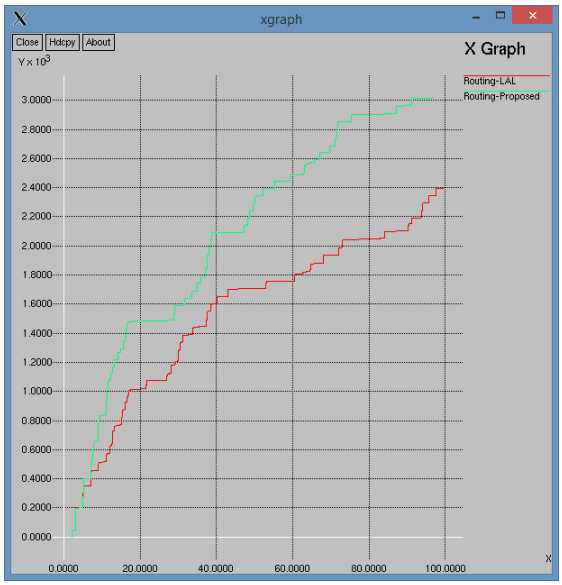
PERFORMANCE METRICS:

We use different metrics to evaluate the performance of the routing protocols, in which the first two metrics are the most important for best effort route and transmit protocols.

PACKET DELIVERY RATIO: or packet throughput, the fraction of the data packets delivered to destination nodes to those sent by source nodes.



ROUTING OVERHEAD: The ratio of the number of control packets (including route request/reply/update/error packets) to the number of data packets.

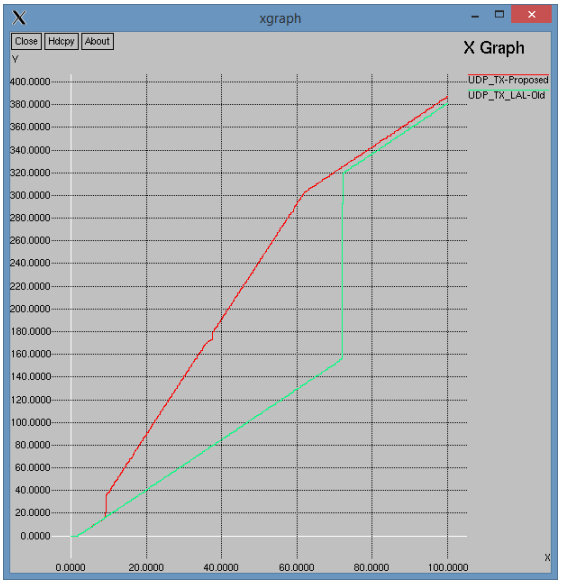


This graph clearly shows that in proposed scheme more no data packet are send as compare to previous scheme.

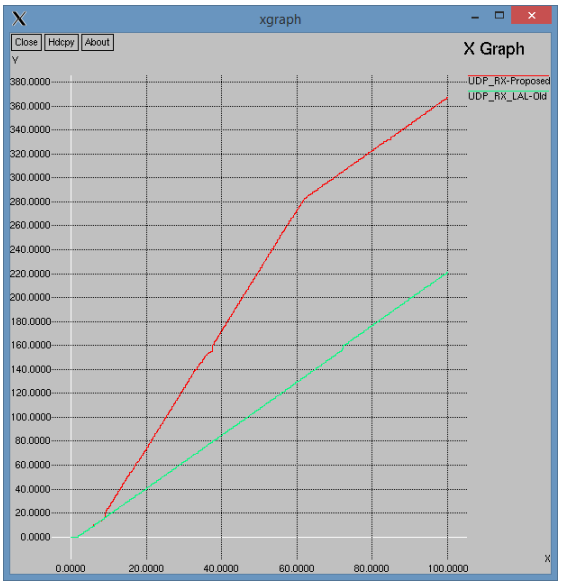
THROUGHPUT: Number of packets sends or receives in per unit of time in network.

In this graph we have shown the comparison between the previous scheme and proposed scheme.
This graph clearly shows that the number of packets send in previous scheme are much less than proposed scheme.

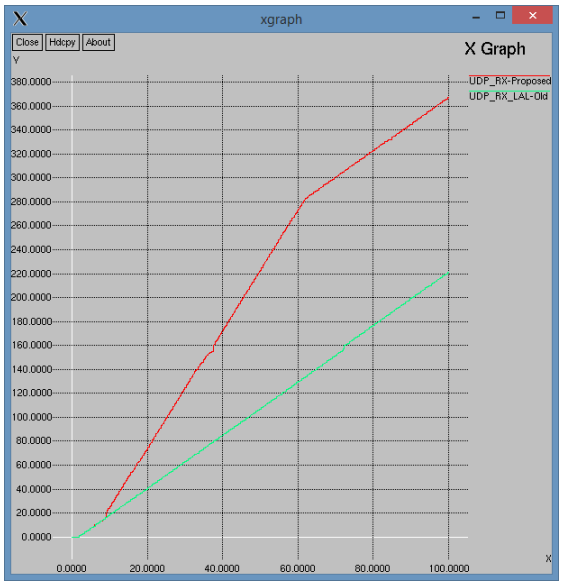
UDP TRANSMISSION ANALYSIS:
UDP is an transport protocol for an end to end connection establishment in network. Here in transmission case it is clearly shown that in proposed scheme the transmission of data packet is comparatively better than the previous scheme.



UDP RECEIVED ANALYSIS: Here in this case it is clearly shown that the total no. of received data in proposed scheme is much better than the previous scheme. The successful delivery of more no. of data ensure the safety of data.



UDP LOST ANALYSIS: Here in this case it is clearly shown that in proposed scheme less no. of data packets are lost during transmission to the destination node as compare to previous scheme.



	Overall Summery		
		Old-LAL	**Proposed**
DATA SEND	=	4281	6057
DATA RECV	=	3936	5825
Throughput	=	39/sec	58/sec
ROUTINGPKTS	=	2398	3019
PDR	=	91.94	96.17
NRL	=	0.61	0.52
Avg e-e delay(ms)	=	593.56	327.5
No. of dropped data	=	345	232

TCP ANALYSIS : Transmission Control Protocol (TCP) is an end to end delivery protocol that provides the connection oriented technique to deliver the data in between sender and receiver. In this graph the performance of TCP Packets in case of TCP proposed and TCP LAL are evaluate. As this graph clearly signify that the TCP Proposed delivers more data packets as compare to TCP LAL.

OVERALL SUMMERY:

This data clearly shows the routing information in a network with the help of localized nodes. The data shows the no. of dropped data from the total no. of packet send in a network. The PDR packet delivery ratio is a ratio of received packet from packet send at time unit.

PDR= (Received/send)*100

The PDR ratio in proposed scheme which is about 96.17 where as in LAL-Old the fraction is about 91.94 which clearly shows the more no. of routing packet are successfully transmitted over the network in proposed scheme as compare to LAL-Old scheme. With this the simulation performance increases which helps in minimizing location error.

7. CONCLUSION:

In this paper we proposed an efficient routing scheme with location based (DREAM) protocol that improves the utilization of node localization. In this the DREAM position based routing feature into an AODV routing protocol .Then the location based routing protocol becomes more efficient and convenient which helps to identify the location of a node in a network or in a radio range in a real time which identifies whether the node is localized or non-localized in respect of radio range. With this the simulation performance increases which helps in minimizing location error. The presence of location information are reduces the unnecessary flooding of packets in network and also provide the base in security to the network by successfully

transmitting the data in a network from sender to receiver with less no. of drooped packet .If the nodes in network knows about the status of location of node than it is easy to find the localized node in a radio range. In our simulation experiments, we simulated the normal routing load, packet delivery ratio etc.

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