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An Efficient and Active Data Delivery for Highly Dynamic Mobile Ad Hoc Networks

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Abstract: *In highly dynamic mobile ad hoc networks occurred transmission problems like delivering data packets, packet delay, time delay and so on. Most of the existing ad hoc routing protocols are affected by node mobility, especially for large-scale networks [1]. Large-scale networks mean that wireless network at the dynamic time. Propel by this issue, position-based opportunistic routing(POR) protocol is efficient to introducing further advantage of the stateless property of Geo graphing routing and the broadcast environment of wireless medium. This POR having the right qualities in delivering the data to destination in highly energetic or forceful MANET. But it is susceptible by the over heading problem and also no data confidentiality. When a data packet is sent out, the neighbor nodes that have overhead the transmission, then serve as forwarding candidates. The specific best forwarder take turn the packets if it is not relayed by best forwarding candidates wit in a certain period of time, so the duplicate relaying caused by packet reroute. Many routing protocols are recommend by mobile-ad-hoc networks. In which the proactive Fish Eye State Routing(FSR) protocol is proposed for provides excellent solution to delivering data to highly dynamic MANETs, by updating and communicating nodes and nodes position and delivering data without over heading. The proposed scheme works well in large network of high mobility nodes. But still we susceptibleness to security threaten. Our security scheme is proposed to minimize the number of black holes or malicious nodes or selfish nodes in the path to destination, thus the number of data packet dropping may be minimized, we secured the FSR protocol with security. In the case of communication break, a Virtual Destination-based Void Handling (VDVH)[9] scheme is further proposed to work together with FSR.*

Keywords: *Ad-hoc Network, FSR, GR, MANET, POR, VDVH*

I. INTRODUCTION

A Mobile ad hoc network is a distributed wireless network. A MANET has several silent characteristics such as dynamic topologies, bandwidth obligated, lessen physical security, power-constrained operation etc[1]. In this network the nodes are moving dynamically without any centralized infrastructure each and every node behaving a self-organizing and self-configuring node acts as router. The MANET have expand in wide range mobile network transmission. But the challenged environments toil with high mobility. No end-to-end routes need to be handled, guiding to GR's high efficiency and scalability. However, GR is very susceptible to the quality of location information[3].

The existing routing protocols(DSDV,AODV,DSR) are affected by node mobility[2]. The concept of such multicast-like routing strategy has already been demonstrated in opportunistic routing Because of the stable and even quick changing network topology[5][6], it is very exhausting to maintain established route. Once the path breaks when the packets are transmitting, the data packets will get lost or be delayed of a lengthy time until the rebuild of the route, this is occurred in hop-by-hop routing manner[7]. Greedy forwarding method used to select next hop forwarder for transmitting the packets to next best forwarder in the large scale wireless environments[4]. But in existing the hop counts are very high. Thus the FSR protocol proposed new qualities for the reliable data delivering in highly dynamic MANETs and to overcome the limitations of POR. The protocol can checks packet over heading and provides security in data transmission in highly dynamic networks. The Virtual Destination-Based Void Handling (VDVH) is one of the further propped work for handling the communication voids. The new system has improved over POR in data delivery, packet transmitting rate, security etc. This paper analyzes the performance of Fish Eye state routing protocol and also organized as follows section 3 deals with the classification of routing, section 4 presents the Working principle section 5 coevals the Simulation Environment Section 6 deals with the Outputs and Section 7 Concludes with the Conclusion and Future Prospects.

Figure.1 Architecture of MANET

II. CLASSIFICATION OF FISH EYE STATE ROUTING PROTOCOL

The system has mobile nodes which are present in highly dynamic network. Each node has its own power resource and computing power and location finding routing mechanism of next hop node.

Each node has specific speed of movement and direction and communication range. The system has "n" number of nodes. A node communicates with each other through Ad-hoc mode thus it is free of any infrastructure based communication. The fisheye technique is used to reduce the routing overhead. The fish eye has the ability to see objects the better when they are nearer to its focal point. It explains each node maintains accurate information about near nodes and not so accurate about far-away nodes. The nodes are exchanges topology information only with their neighbors. The Reactive Routing Protocols are also called On demand routing protocols since they don't maintain routing information or routing activity at the network nodes if there is no communication. If a node craving to send a packet to alternative node then this protocol searches for the route in an on-demand manner and establishes the connection in order to transmit and apprehend the packet. The route discovery consistently arise by calamity the route request packets throughout the network. In the presence of an authentication protocol to protect the upper layers, external threats are detected at the physical and data link layers. The external threats again can be divided into two categories. Passive Threats or threats to confidentiality or Eavesdropping. Active Threats or threats to the integrity and availability . The threats posed by internal nodes are very serious; as internal nodes are have the necessary information to participate in distributed operations. Internal threats also can be divided into two types; active threats and passive threats. Internal nodes can misbehave in a variety of different ways. These can be differentiated into three categories - failed nodes, badly failed nodes, selfish nodes or malicious nodes.

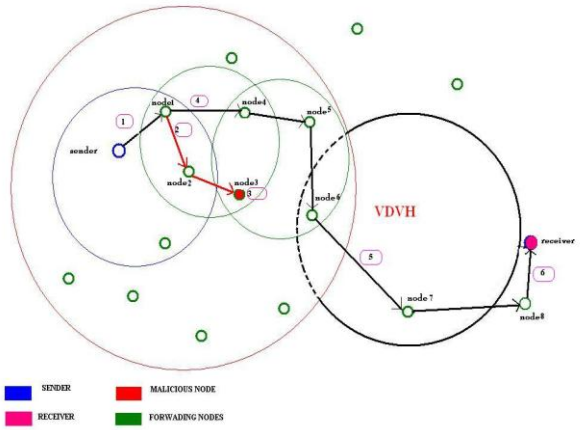


Figure 2 FSR Architecture

III. WORKING PRINCIPLE

The system design understandable how the mobile node can transmit a packet from source to destination using neighbor nodes. In wireless infrastructure using the MAC layer. It is a network interface. The neighbor nodes are selected by candidate set selection and shortlisted. The POR registered the node location and also predetermined the virtual destination node. In between that the Fish Eye State Routing can control the dynamic forwarding nodes for transmit the packets to virtual destination. After that the virtual destination nodes identified the destination node. If any communication hole occurred, the virtual destination void handling has capable to deal with this kinds of communication void, so that the transmission is frequently. The best forwarder

ahead the packets to next nodes and find the destination timely manner. The FSR can overcomes the packet discard problem by discover the available as another choice route and transmission.

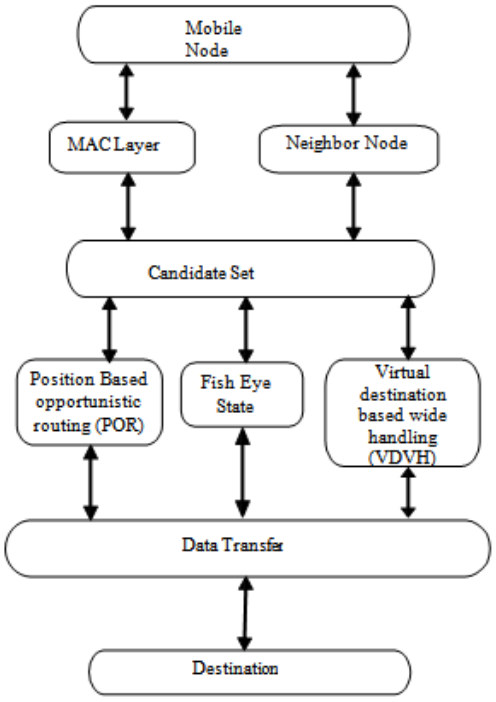


Figure 3 System design for proposed system

The fig 3 describes the working procedure of proposed system in the highly dynamic mobile ad hoc networks using the secure FSR protocol and transmission reliable and efficient.

IV. COMPARISON BETWEEN PROPOSED AND EXISTING SYSTEM BLOCK DIAGRAM

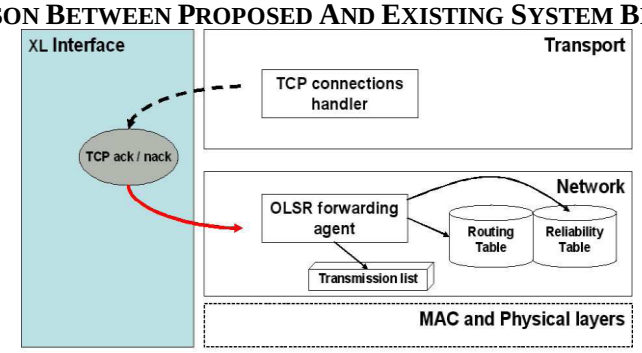


Fig 4 System design for Proposed and Existing system

The Existing system design explains in POR discovery and recovery procedures for neighbor nodes are also time and energy consuming so that the Performance degrades when node mobility increases. If Communication holes occur the interface node can lose the connectivity and then duplicate relaying appear. So the source node can do packet sending again so its chance to be traffic on forwarding agents. The intermediate nodes cannot correctly identified virtual destination node. In proposed system, Uses the fisheye technique to reduce the routing overhead Each node has its own power resource and computing power and location finding routing mechanism of next hop node. Nodes exchange topology information only with their neighbors. The routing overhead is also reduced due to different frequencies of updates among nodes of different scopes

V. SIMULATION CIRCUMSTANCES

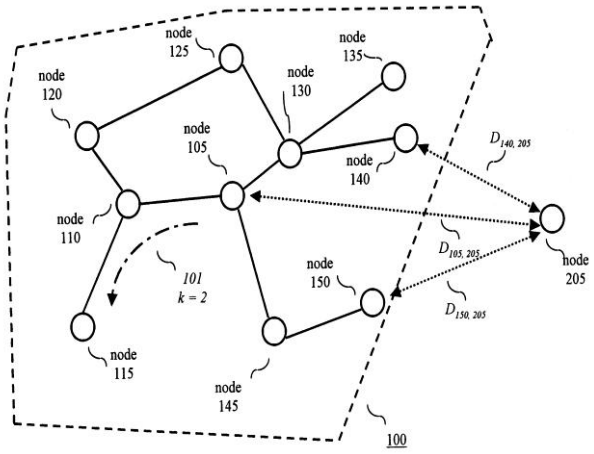
This proposed routing protocol has been implemented by the Network Simulator2 (NS2). The Network Simulator is mainly utilized to implement the routing protocols in the networking research. The Main focus of our Fish Eye State routing is reducing the Node Mobility, duplicate relaying, traffic, and good packet deliver. The simulation results are shown below.

Number of Nodes	50
Packet size	512bytes
Antenna	Omni antenna
Channel	Wireless channel
Bandwidth	$2x10^6$
Layer	MAC layer
X Width	2200
Y Width	2200
Supporting protocol	POR
Bit Rate	CBR

Tables 1 Simulation Framework

VI. DATA FORWARDING IN POSITION OPPORTUNISTIC

In opportunistic networks, mobile nodes are enabled to communicate with each other even if a route connecting them never exists. Likewise, nodes are not brainstorm to dominate or acquire any knowledge about the network topology, which is preferably cardinal in traditional MANET routing protocols. Routes are stout dynamically, while messages are en route between the sender and the destination(s), and any applicable node can capable to be used as next hop, contribute it is likely to companion the message closer to the final destination. In opportunistic networking no assumption is made on the existence of a complete path between two nodes wishing to disclose. Source and destination nodes authority never be connected to the same network, at the same time. Opportunistic networking techniques allow such nodes to exchange messages between them.



position-based opportunistic routing mechanism which can be deployed without complex modification to MAC protocol and achieve multiple reception without losing the benefit of collision avoidance provided by 802.11. The concept of in-the-air backup significantly enhances the robustness of the routing protocol and reduces the latency and duplicate forwarding caused by local route repair when a source node wants to transmit a packet; it gets the location of the destination first and then attaches it to the packet header. Mature to the destination node's progress, the multi hop path may diverge from the true location of the final destination and a packet would be dropped even if it has already been delivered into the neighborhood of the destination. To conception with such issue, collateral check for the destination node is bring out. At each hop, the node that promote the packet will check its neighbor list to see whether the destination is within its hauling circle. If yes, the packet will be plump forwarded to the destination. By performing such identification check before greedy forwarding based on locality information, the effect of the path departure can be very much alleviated.

The Network Simulator outputs are following next section with suitable descriptions.

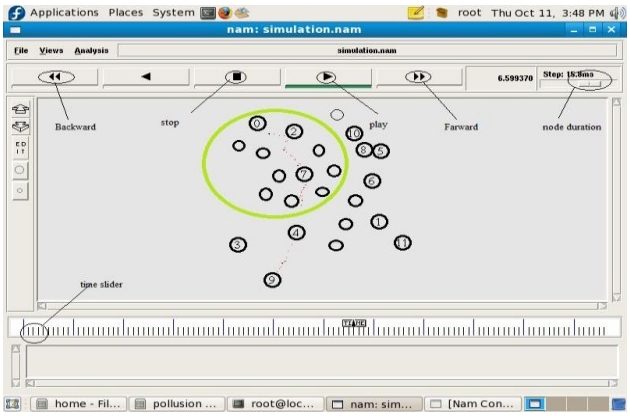


Figure 5 Node Selection

The Fig5 describe the selection of forwarding nodes for data transmission in a dynamic time. The mobile devices and mobile phones are mainly used for this transmission.

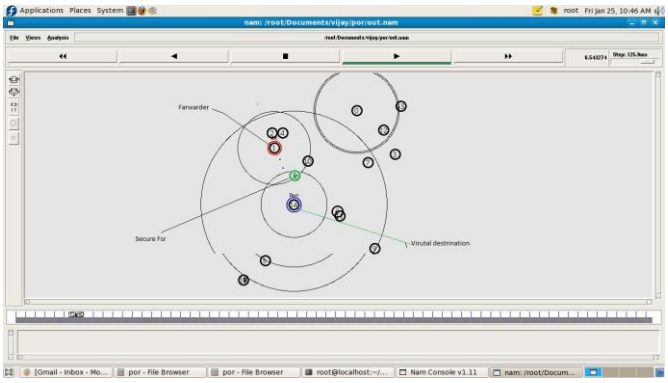


Figure 6 Secure Fsr node route

The fig 6 describes the secure Fish Eye State node can control and maintains accurate information about the neibhor nodes. The nodes exchange topology only with their neighbors. It can finding the alternate path for frequent trasmission.

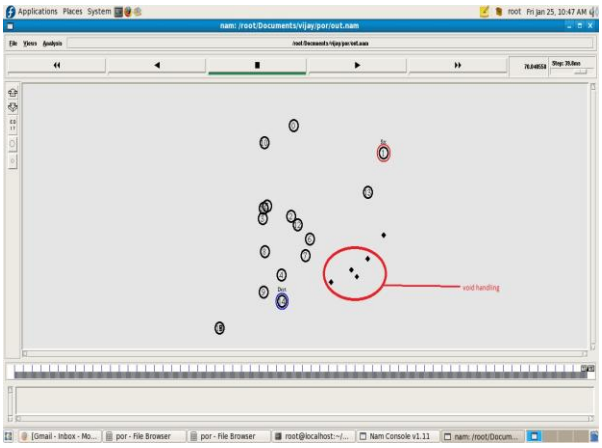


Figure 7 Void handling recovery

The fig 7 describes when the nodes are selfish the communication holes will be appear so the nodes can't forward the packets. During this void handling process. So that the virtual destination is introduced for temporary target.

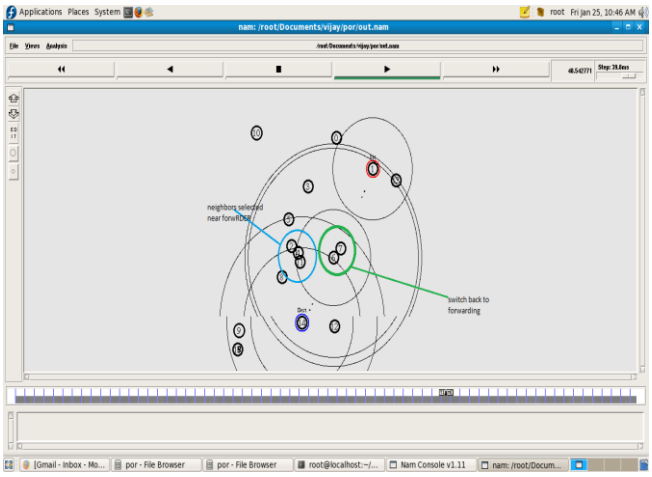


Figure 8 Greedy forwarding to destination

The fig 8 describes overcome the problem of void handling and then how to switch back to greedy forwarding during communication voids. The forwarding candidates can preferred neighbor nodes with FSR technique. After that the packet has been forwarded to next hop. The nodes in the MANET are resource constrained; resource may be bandwidth, activity etc. Most of the nodes in MANET relay on batteries as their source of capability; so, some of the nodes appear maliciously to conserve their limited battery effectiveness. So, when the data packets are ahead to the destination these selfish nodes simply do not forward the data packets towards the destination. So all the packets move up to that node and abscond. Hence, these nodes persevere as a black hole which causes data packet dropping. Black hole attack can be launched both on control packets and data packets, but here we have considered the case of data packets, considering in fish eye state routing algorithm the number of control packets are very less compared to the number of data packets. But, when forwarding data packets if some of the packets are dropped, then alternate route is searched to forward the packets even if that route is the shortest one. This increases the time complexity of the protocol. This is the receiving section from the virtual destination, so greedy forwarding perform switch back, because it finds that its own location and nearer to the real destination, it makes positive progress towards the real destination. Mainly the FSR technique reduce the hop count and make the transmission reliable.

VII. CONCLUSION

The proposed routing protocol SECURE FISH EYE Routing Protocol [FSR] transmits a packet from source node to transmits a packet to the destination and it moves to the destination node without communication voids were analyzed by using NS-2. The Fish Eye State Protocol provides good packet delivery and reduce duplicate relaying and reduces time delay compare to existing system with using POR it reduces the time to recover the route to destination and uses few nodes to transmit so the packet loss is less. A virtual destination-based void handling scheme is proposed, Using FSR Algorithm For Data transaction connection Reliable For packet Sending to Destination Traditional void handling method performs poorly in mobile environments while VDVH works quite well.

VIII. FUTURE WORK

In future we proposed for Multicasting in MANETs. And also developing wireless medium using for reliable transmission in large wireless network topologies. In future the frequent fast changing networks can handled the communication using intermediate nodes. To work with the multicast drive style, a virtual destination-based void handling scheme is proposed.

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