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Enhancing the Communication Range and Reliability of Mobile ADHOC Network Using AODV-OSPF Protocol

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Abstract
The increasing density of node and communication range of mobile node raised some problem such as dropping of packet and degraded the performance of network. For the improvement of performance of AODV routing Protocol in mobile ADHOC network various authors used different size of adjacency matrix in AODV routing protocol. In this paper proposed an improved AODV routing protocol using OSPF routing adjacency matrix in AODV protocol. The size of OSPF matrix is large instead of AODV.The change the size of matrix increases the communication range of mobile node. The increased range of communication increases the throughput of mobile ADHOC network. The proposed model simulates in ns-2.34 and compared with AODV routing protocol. Our experimental result shows better performance of AODV-OSPF routing protocol.
Keywords: - ADHOC Network, AODV, MDR and OSPF

I. INTRODUCTION

A mobile, ad hoc network is a self-directed system of mobile node connected by communication links. The nature of infrastructure of mobile ADHOC network is dynamic. The process of communication are performed in dedicated area If two mobile node are not within signal range, all message communication between them must pass through one or more intermediate mobile node[11]. The mobile nodes are free to move full range of communication, thus varying the network topology animatedly. Thus routing protocols must be adaptive and able to maintain routes in spite of the changing network connectivity[16]. The process of communication of AODV routing protocol suffered from the problem of dropping of packet and huge amount of traffic. The generation of traffic and dropping raised due to size of adjacency matrix. The sizes of matrix are changed control the traffic situation in AODV routing protocol[15]. For the improvement of size used OSPF protocol. The OSPF mechanism providing control traffic reduction is the designated router mechanism OSPF [19]. However, in a mobile ADHOC network, due to the fact that mobile ADHOC network do not have the same set of mobile ADHOC network neighbors. OSPF extensions for MANET thus use alternative mechanisms. Aside of miscellaneous tweaks and tricks such as implicit acknowledgements or control traffic multicasting, these alternative mechanisms can be classified in the following categories. Flooding reduction and support[12]. Instead of the usual, raw flooding scheme, use more sophisticated techniques that reduce redundant transmissions adjacency matrix Selection. Instead of attempting to become adjacent with all it's near, a router becomes adjacent with only some selected near nods. Topology Reduction[18,24]. Report only partial topology information in LSAs, instead of full topology information. Hello Redundancy Reduction. In some Hello messages, report only changes in neighborhood information instead of full neighborhood information. Flooding Optimization[14]. The above section discuss introduction of ADHOC network and OSPF[13,25]. In section II we describe related work of AODV-OSPF routing protocol. In section III proposed methodology. In section IV discuss our experimental result analysis finally conclude in section V.

II. RELATED WORK

This section gives an extensive related work on the existing AODV with OSPF routing protocol for secured communication and increase the range of communication area. A lot of work has been done on proposing solutions to the fundamental issues generated when integrating MANETs with fixed networks. Some of the proposed solutions have involved using an extension of the OSPF routing protocol used in fixed networks and modifying some key properties to enable it to function in MANETs, others have taken the path of combining the already existing MANET routing protocols with OSPF with techniques that accomplish the goal of inter-domain routing.

[I] in this paper authors describe reactive protocols like AODV for TANs because of its higher latency and route request flooding. In the case of AODV, the overhead saturated the network constantly with all to-all traffic. Some modified work is needed to understand if tuning AODV parameters would

benefit the network. All in all, traditional MANET protocols can be leveraged for tactical airborne networks and additional work is needed to ensure high delivery success without increasing overhead.

[2]OSPF routing protocol increase the convergence range of communication, Also, the large size of routing domain, and possible occurrence of mobile ADHOC network (MANET) mechanism, requires highly scalable operation on part of OSPF to stay away from routing flux. Current decade have seen important hard work to improving OSPF's convergence speed as well as scalability and extending OSPF to achieve seamless integration of mobile ADHOC networks with conventional wired networks.

[3] Authors used genetic algorithm to solve a network routing problem related to communication. The proposed algorithm to find the shortest path between the source and destination nodes. A simple genetic algorithm is developed to find the shortest path routing in a dynamic network. The developed algorithm uses an efficient coding scheme.

[4] Authors propose a new heterogeneous routing protocol specifically designed for the hierarchical ad hoc network routing protocol. also there a new active clustering scheme to help build a new constant hierarchical configuration, which is fundamental to heterogeneous routing protocols. Stable clustering scheme to dynamically build a physically hierarchical ad hoc network. A large-scale network is then divided into stable small local subnets, similar to the current Internet hierarchical structure [17,22]. However, our wireless backbones are mobile backbones, thus suitable to the mobile computing environment.

[6] Author describe a new algorithm for dynamic routing of bandwidth guaranteed tunnels where tunnel routing requests arrive one-by-one and there is no a priori knowledge regarding future requirements. The problem is motivated by service provider needs for fast deployment of bandwidth guaranteed services and the consequent need in backbone networks for fast provisioning of bandwidth certain path. Offline routing algorithms cannot be used since they require a priori knowledge of all tunnel requests that are to be routed[20]. Instead of , on-line algorithms that hold requests arriving one by one and that satisfy as many potential future demands as possible are needed.

[7] Authors propose a new mobility model founded on social network theory. This proposed model allows collection of hosts to be grouped together in a way that is based on social relationships among the individuals. The combination is then mapped to a topographical space, with activities prejudiced by the strength of social ties that may also change in time.

[8]Routing adaptation methodologies are investigate, which make use of traditional routing protocols such as OSPF in grouping with MPLS. even as having the common of traffic routed along optimized shortest paths, MPSL is only partially introduce to complement the adaptation process.

[9]Author proposes the oblivious routing scheme based on shortest-path routing and load balancing. here present the LP model that find the optimal routing path. The gain that can be achieved for many topologies is significant, and grows with the degree of a node in the network. It is exposed that gain is achieve for all major ISP topologies. The completion of this routing method would make it possible to satisfy greater demands without changing the network topology. Since it is based on the OSPF algorithm, and a simple linear programming algorithm, the required network upgrade is of acceptable complexity[21,23].

[10]This title thus focuses on schemes that complement existing ad hoc broadcast mechanisms (inherently unreliable), which can assurance the full transmission of critical messages, when necessary. An exciting approach in this domain is the use of a covered network, over which significant messages are approved peer to peer, in order to confirm the actual diffusion.

III. PROPOSED METHODOLOGY

In this paper we modified the OSPF-MDR routing protocol for mobile ADHOC network. OSPF-MDR routing protocol is extension of mobile ADHOC routing protocol for the improvement of communication range of node. In mobile ADHOC network multi-hope commutation loss of data rate is very high. For the increasing range of signal strength and reliable communication Proposed optimal routing protocol for MANET using MDR. The MDR process increases the range of adjunct of OSPF routing. According to survey of OSPF implementation of MANET network on data accumulate by their researchers, OSPF-MDR has been challenged as a suitable routing protocol for MANETs. OSPF-MDR is the MANET extension of OSPF. It is based on the selection of a subset of MANET routers consisting of MANET designated routers (MDRs) and Backup MDRs that form a connected dominating set (CDS). The CDS is used to reduce flooding overhead, as only the MDRs and Backup MDRs flood new link state advertisements (LSAs) out the receiving interface to their neighbors. In addition, adjacencies are formed only between MDRs and a subset of their neighbors which provides proper scaling in large scale networks. Fast convergence to topology changes has emerged as a critical requirement for today's routing infrastructures. However, limiting the processing/bandwidth overhead of the routing

protocol continues to be as important as before. OSPF, being a distributed protocol, requires timely execution of certain operations, e.g., generation and processing of hello packets, by the participating routers. This process might be causing the alleged lack of convergence of OSPF. AODV routing protocol is enhanced by MDR technique. In MDR technique basically three sections are added in basic AODV routing protocol. There are three new elements introduced to improve the existing AODV in recvReply() function namely are 1) the rrep_table to store incoming RREP packet, 2) mali_list to keep the optimal path and 3) the rt_upd, parameter to control the routing table update. In this fashion MDR technique of improved AODV routing protocol for diversity range of communication. An outlier is process from that process we find the boundary side node in ADHOC network under certain condition. The outlier detection algorithm is Unsupervised learning approach is employed to this model. The rate of unsupervised learning is a new description or demonstration of the inspection data, which will then lead to improved potential responses or decisions. Outlier methods do not need the prior knowledge of inner node and outer node communication in ADHOC network, but instead detect changes in behavior or unusual communication. These methods model a baseline distribution that represents normal behavior and then detect observations that show greatest loss of packet from the normal. Outliers are a basic form of non-standard examination that can be used for outer node detection. In supervised methods, models are trained to discriminate between outer node and non-outer node behavior so that new observations can be predefined to class. Supervised methods require accurate identification of outer node communication in ADHOC network and can only be used to detect outer node of a type that have before occur. An improvement of using unsupervised methods over supervised methods is that beforehand undiscovered types of outer node may be detected. Supervised methods are only trained to tell apart between legitimate communications and previously known outer node. In the process of MDR with outlier is perform as , the outer node form range of communication treat as abnormal and stop the control message transmission and create spate class of all these node and spread information to all neighbor node for updating routing table. This algorithm consists of two sections: the outlier class and the outer node class. And the entire node of ADHOC network treats as normal node.

IV. Algorithm description

ALGRITHM: MDR _OD INPUT: RECV (), distance d, number of node k, number of outlier node m
OUTPUT: m outliers, outer node node MN
METHOD:
BEGIN
MDR _OD (RECV (),d,k);
When (RECV=0) MN (m);
END
1) Outlier class
PROCEDURE MDR _OD (RECV (),d,k);
BEGIN
(1) FOR each node with distance d=0;
(2) IF the destination node d=∞
Found all (MN)
(3) FOR all node= 0 III normal class DO
(4)N .addclass(m);
(5) ENDIF
(6) Remove normal node N form outer node MN from current class
(7) outerslist MN(d=∞);
END
2). Outer node class
PROCEDURE MN(m)
BEGIN
(1) Perform a RECV() and MAIL LIST FROM MN GROUP;
(2) Return M node with minimal class (MN)
END

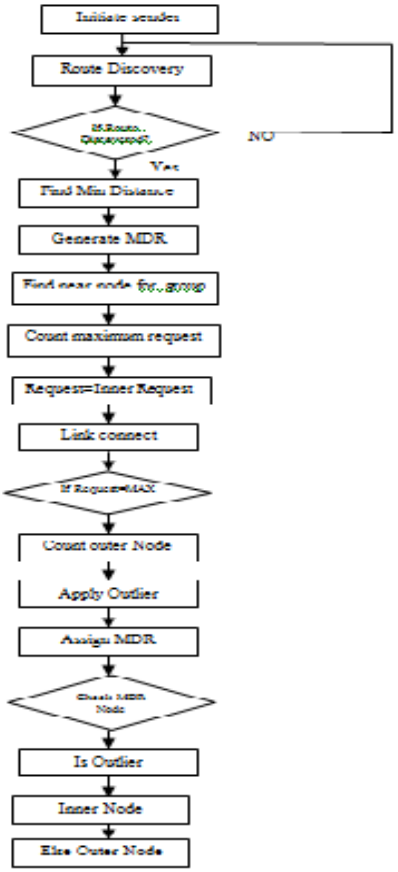

Figure 1 proposed model of improved AODV-OSPF routing protocol.

V. EXPERIMENTAL RESULT ANALYSIS

For the effectiveness of our proposed model simulate in discrete network simulator ns-2, and used some standard parameter for performance analysis.

Parameter	Value
Simulation duration	**100 sec**
Simulation area	**1000*1000**
Number of mobile node	**30**
Traffic type	**Cbr(udp)**
Packet rate	**4 packet/sec**
Host pause time	**10sec**

Performance Parameter:-

Throughput: It gives the fraction of the channel capacity used for useful transmission (Data packets correctly delivered to the destination) and is defined as the total number of packets received by the destination. It is in fact a measure of the effectiveness of a routing protocol [14].

Average end-to-end delay: This includes all possible delays caused by buffering during route discovery latency, queuing at the interface queue, retransmission delays at the MAC, and propagation and transfer times[7].

Packet delivery fraction: The ratio of the data packets delivered to the destinations to those generated by the traffic sources [10]

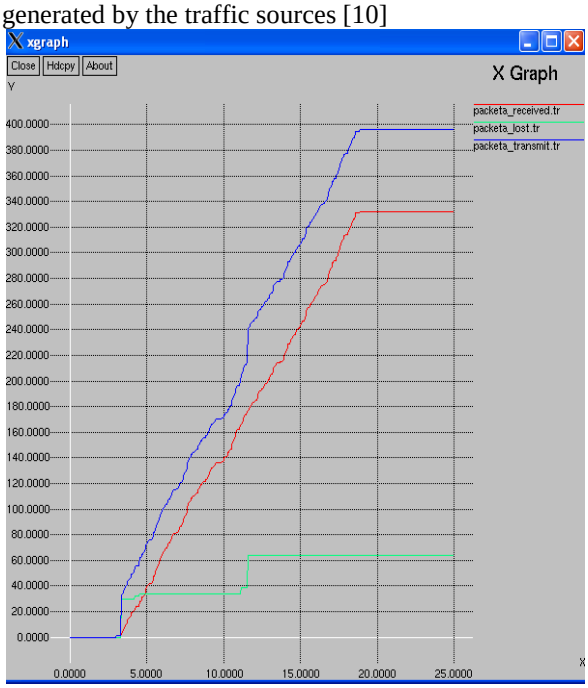

Figure 2 shows that the compression of 30 node simulation of overall simulation in terms of packet received, packet send and packet lost in both protocol AODV and AODV-OSPF routing protocol.

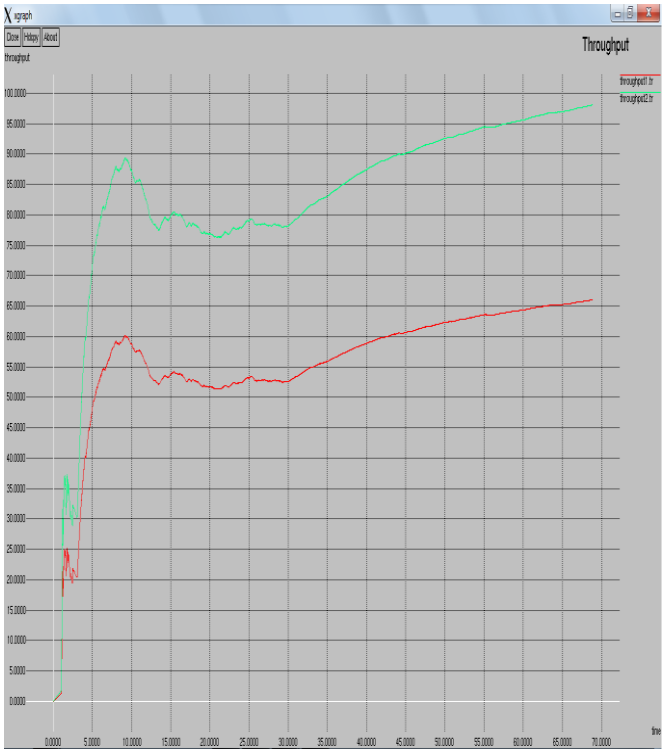

Figure 3 shows that throughput of packet send and received in communication mode in both two protocols AODV and AODV-OSPF.

Figure 4 shows that packet delivery ratio of simulated node in given scenario of AODV Protocol and AODV-OSPF routing protocol.

VI. CONCLUSION AND FUTURE WORK

Without infrastructure and node mobility in ad hoc network is a great challenge in reliability concern. For reliability concern various method are proposed for node signal strength in mobile ad hoc network. The MDR scheme of leader agent and member surveillance greatly reduces the relative

calculating overheads and communication costs. Generally speaking, when leader agent node and surveillance nodes can ensure the reliability, the communication result is reliable. The dissertation proposes a novel scheme for outer outlier node detection in mobile ad hoc network. Our proposed method uses unsupervised learning technique for MDR formation. Our proposed method also removes the node ambiguity in outer range node. And minimize a packet dropping in mobile ad hoc network. Our proposed mechanism has overcome some of the limitations like it has the required some extra computational time for the process of MDR allocation in terms of normal and abnormal. It also introduces little bit computational overhead during route advertisement and path establishment. proposed state of the art on reliable MANETs against packet dropping of outer node. The outer scheme as well as prevention, detection and reaction mechanism we have explored. We categorized them into three categories according to their goals and their specific strategies. We concluded the proposed schemes based upon certain assumptions and their specific characteristics. These works assume that a node tries always to maximize its benefit by choosing whether to cooperation the network or not. However those works are based on assumption that the majority of the nodes are inner which not a usual case in MANET is. We can extend this existing approach for maximum number of nodes in a wireless environment through the use of more secure channel and functionality of using buffer system. In future the current AODV-MDR performance can be improved with the help of other techniques. In future enhancement we can improve this performance by using rough set theory approach.

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