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Performance of Ad hoc On-Demand Distance Vector Routing

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Abstract

Growing highly efficient routing protocols for Ad hoc Network is a demanding mission. In this paper, the proposed technique for signal strength based link availability prediction to be used in routing. In order to full multiple routing necessities, such as low packet delay, delivery rate of high packet, and effective adjustment to network topology changes with low control overhead etc,. The estimate of the nodes breakage of the link time and additional notifies the other nodes about the link breaks in the route. Therefore, either local route repair or new route discovery is initiated much earlier than the route breakage. It reduces the data packet losses as well as continuous delay. The proposed method is contrasted with and without link prophecy. The outcome demonstrates that here is considerable reduction in packet drops and average end-to-end delay and also an improvement in data packet delivery ratio with link prediction. Proposed approach results are in progress in the Service excellence.

INTRODUCTION

Ad-hoc network consists of mobile stand which are free to communicate without any infrastructure and central control unit [1].This can operate in an isolated manner or with fixed networks through gateways. The Ad hoc Networks is an independent system of nodes, which has numerous significant characteristics, namely, dynamic topologies, limited physical security, bandwidth and energy constrained operations [3]. Unlike from wired networks, Mobile Ad hoc Networks (MANETs) are infrastructure less networks which consist of wireless mobile devices. Since these mobile devices can join and leave the network freely, the network topology can change very frequently [6]. Due to the lack of infrastructure, devices in such networks need to cooperate with each other and work in a self-organized manner through wireless channels. Therefore, developing proper routing protocols for MANETs is a challenging task [4]. New routing protocols designed for MANETs are supposed to work in a self-organized manner and provide low packet delay, high packet delivery rate and effective adaptation [5].

PROPOSED METHOD

The Proposed Technique allows dynamic, self-starting, multi hoop routing between contributing mobile nodes craving to set up and sustain an ad hoc network. AODV allows mobile nodes to obtain routes quickly for new destinations, and does not require nodes to maintain routes to destinations that are not in active communication [14]. AODV allows mobile nodes to respond to link breakages and changes in network topology in a timely manner. The operation of AODV is loop-free, and by avoiding the Bellman-Ford "counting to infinity" problem offers quick convergence when the ad hoc network topology changes (typically, when a node moves in the network)[11]. When links break, AODV causes the affected set of nodes to be notified so that they are able to invalidate the routes using the lost link [10].

Every node seeks to preserve an efficient sight of its instantaneous neighbors at any time, in order to detect link failures rapidly, before they can lead to packet losses. The existence of a neighbour node can be confirmed when a message is received, or after any other successful interception or exchange of signals. The disappearance of a neighbour is implicit when such an event has not taken place for a certain amount of time or when a unicast transmission to this neighbour fails. The flow chart of link prediction algorithm as shown in Fig.1

RESULTS AND DISCUSSIONS

The proposed routing algorithm simulated with and without AODV link prediction to verify recital gain. The Random waypoint approach is used for the mobility of nodes representation and IEEE 802.11 is used for simulation. The estimation error is to reduce by the average pragmatic values have considered at same parameter.

The complete simulation parameters are outlined in the table 1.

Table 1. Parameters

Traffic pattern	Constant bit rate and TCP
Simulation duration	900 s
No of connections	20, 25, 30, 35, 40 and 45
Packet rate	4 packets/s
Mobility rate	5,10, 15, 20, 25, 30 m/s
Pause time	10 s
Surface Simulation	1500 m by 300 m
Total nodes	25, 50, 75, 100 and 125
Data packet size	512 bytes

The performance of the proposed approach is investigated in lexis of figure of route failures, packet delivery ratio (PDR) and end-to-end survey. The varied no of nodes are chosen from 25 to 125.The Fig.2 exhibits the response of route failures with respective chosen various nodes with using AODV and AODVLP at constant bit ratio (CBR).the simulated results are depicted that the route failures are reduced in AODVLP Contrasted to AODV.

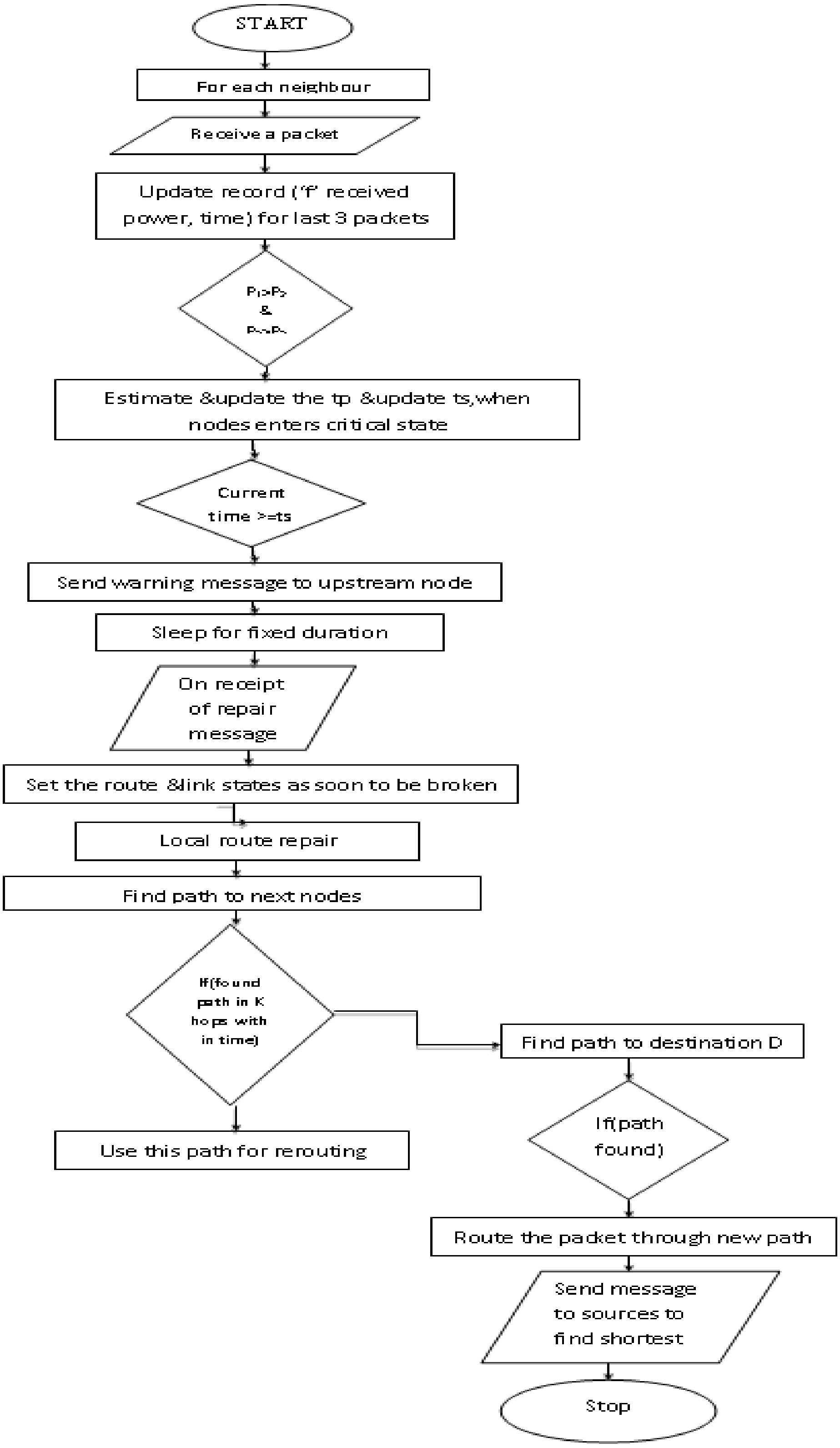

Figure 1. Flowchart of link prediction algorithm

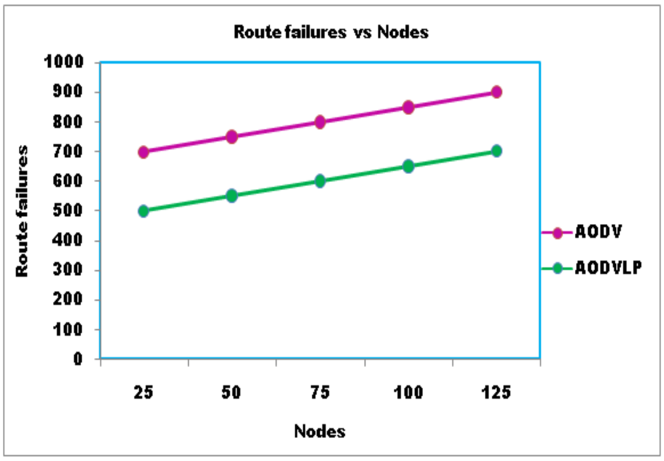

Figure 2. Response of route failure at CBR using AODV and AODVLP

Fig. 3 illustrates the PDR with increasing network size, the simulation results are presented and analyzed that AODVLP Packet delivery ratio (PDR) is superior to the AODV. As in AODVLP, before the route failure needs to be discovered the alternative routes and more data is successfully delivered to the destination. Fig.4 shows the response of RTS collisions per node.

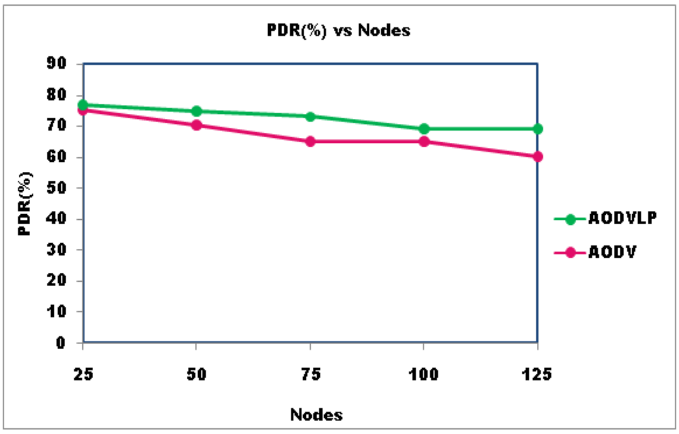

Figure 3. Response of packet delivery ratio at CBR using AODV and AODVLP

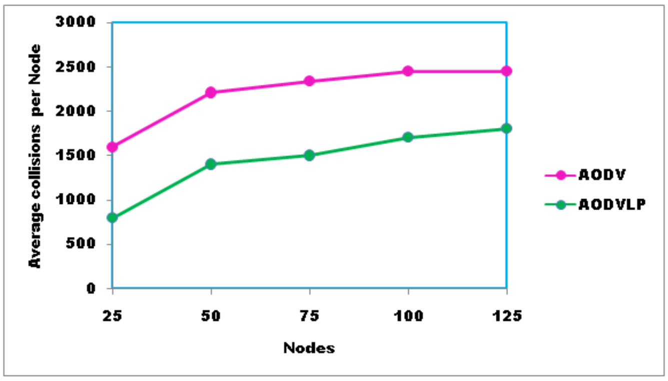

Figure 4. Response of response of RTS collisions per node at CBR using AODV and AODVLP

Fig.5 exhibits end-to-end delay decreases in AODVLP as compared to AODV. Figure 6 illustrates route failures variation with node velocity increasing. As of investigated results, it is reasonably marked that AODVLP offers less route failures than AODV due to link prediction approach supports in find out the alternative routes in proceed before a link failure, and information is conveyed by the alternative routes.

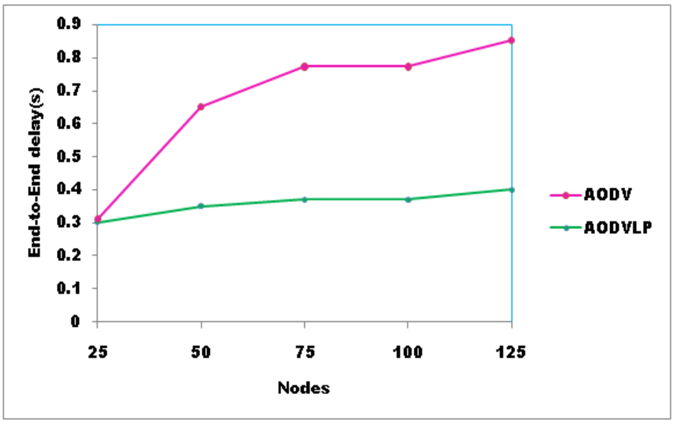

Figure 5. Response of RTS end-to-end delay at CBR using AODV and AODVLP

Fig.6 illustrates the response of route failures using ADOV and ADOVLP Respective chosen node velocity from 5 to 30 m/s at constant bit ratio (CBR). Meanwhile, one variable has changed and other two have kept constant parameters. Consider network size is 50 nodes, chosen node velocity and pause time is respectively 5m/s and 10s.Fig.7, Fig.8, Fig.9 are represents the

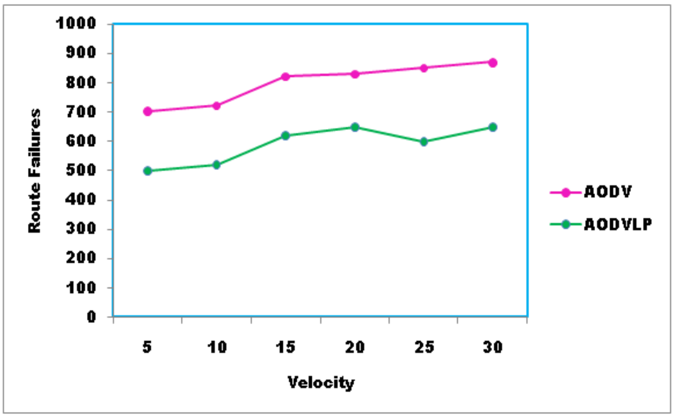

Figure 6. Response of Route failures with respective velocity at CBR using AODV and AODVLP

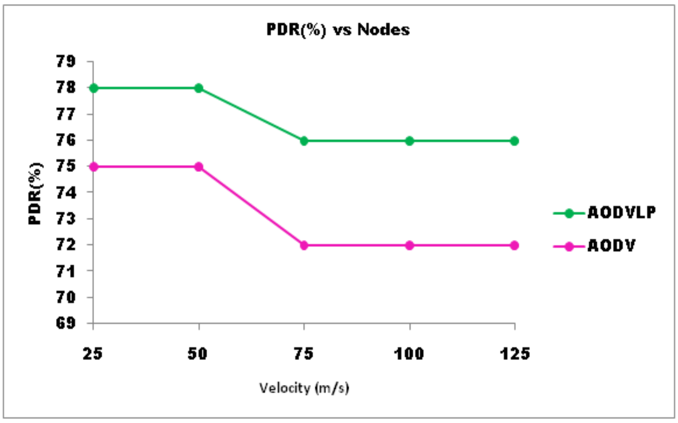

Figure 7. Response of packet delivery ratio with respective velocity at CBR using AODV and AODVLP

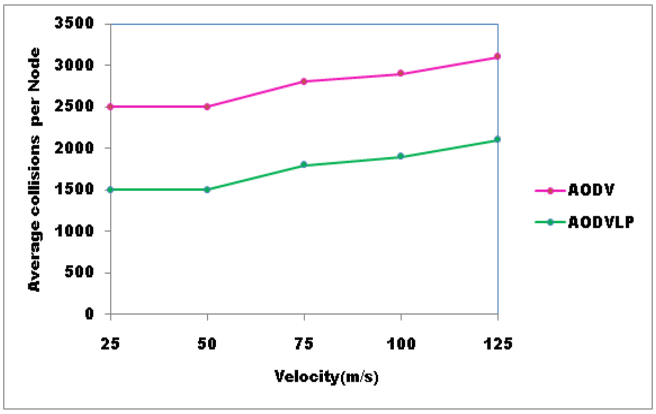

Figure 8. Response of RTS collisions with respective velocity at CBR using AODV and AODVLP

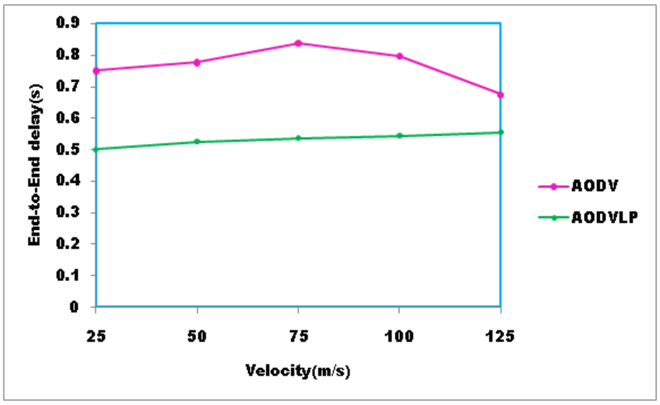

Figure 9. Response of end-to-end delay with respective velocity at CBR using AODV and AODVLP

Fig.7, Fig.8 and Fig.9 shows significant improvements in the number of route discoveries for different number of conversations representing that the protocol is able to decrease the number of route discoveries by approximately 30%. Observe that it also interprets to progress in the fraction of lost packets. Figured that in the simulation model of the AODVLP protocols, data packets are not buffered when the route discovery is in progress. The end to-end delay, on the other hand, has increased a small in the protocol. This is due to the actuality that the alternate routes are naturally longer than the prime. Complete implementation of the simulator discloses that 30–40% of delivered data packets use alternate routes. Results confirmed that packet delivery ratio is improved in AODVLP as measure up to to AODV. The packet delivery ratio decreases as the node velocity increases because faster mobility of nodes, while in the simulations.

CONCLUSION

This paper presents the proposed AODV routing protocol with link prediction for adhoc networks. The routing protocol which presents a common structure for optimization solutions to dynamic routing problems in MANETs. The proposed prediction function is that predicts link breaks based on signal strength of the successive traditional packets and threshold signal strength. This Work presented a detailed comparative analysis in terms of protocol design and simulation related parameters for Proposed and existing protocols. The performance of simulation results are analyzed investigated and compared the proposed AODVLP model with AODV. The simulation results are observed that the proposed algorithm AODLP performs is better than the AODV.

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