

# **BRIEF REVIEW OF ZRP IN MANET**

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## **ABSTRACT**

A mobile ad hoc network (MANET) which is also known as wireless ad hoc network or a mobile mesh network is comprises of mobile nodes that can communicate with one another by exploiting wireless links. Mobile nodes that are within each other's radio zone communicate directly via wireless links, while those far apart lean on other nodes to transmit messages as routers. ZRP is a hybrid routing protocol applicable to wide range of MANET. The Zone Routing Protocol is predicted on the concept of zone radius. A routing zone is defined for all nodes and also predicted for the zones of neighboring node overlap. ZRP uses both proactive and reactive approach. The main objective of this survey paper is to study various enhancement of ZRP in terms of throughput, reduction of power consumption, routing overhead, latency and so on.

**Keywords-** Inter Zone Routing Protocol (IERP), Intra Zone Routing Protocol (IARP), Mobile ad-hoc Network (MANET), Routing Algorithms, Zone Routing Protocol (ZRP).

## **INTRODUCTION**

### **1) MANET**

A mobile ad hoc network (MANET) composed of mobile nodes that can communicate with one another by exploiting wireless links. In this case, a path across two hosts may consist of hops through one or more than one nodes in the MANET. An important problem in a mobile ad hoc network is discovering and preserving routes as host mobility can make topology changes. [2] MANETs have been utilized in scenarios when an infrastructure is not available, the cost to utilize a wired networking is not worth it, or there is no time to set up a locked infrastructure. A

few scenarios where an ad hoc network can be used are emergency service ability, conferencing embedded computing sensor dust, home networking. Algorithms for a MANET must self-configure to adjust to situation and traffic where they pace, and goal modification must be taken from the user and purpose. In an ideal case, a routing algorithm for an Ad hoc network should not only have the generic characteristics of any routing protocol but it also have the explicit characteristics of a mobile domain in particular, bandwidth and energy restriction and mobility.

## **2) ROUTING**

Routing in MANET ad hoc network depends on different factors like, including choice of routers, modeling of the topology, and initiation of request, and specific underlying manner that could serve as a heuristic in finding the path efficiently. The issue in routing of mobile ad hoc networks express to how mobile nodes can interact with one another, over the wireless media, on the outdoors of backing from infrastructure network unit. Various routing algorithms have been proposed for mobile ad hoc networks to accomplish effective routing. Hybrid Routing is an approach that is frequently utilized to bring a proper balance between the adaptability to varying network happenings and the routing overhead. These protocols acquire a fusion of reactive and proactive basis, both are applied under various distinct circumstances, places, or regions. Routing algorithms and protocols required to be both, bandwidth and energy efficient and must take into account the limited processing power of wireless devices and low capacity. Based on the routing update mechanism, Ad hoc wireless network routing protocols, basically divided into various categories.

### **2.1 Proactive routing**

### **2.2 Reactive protocols**

### **2.3 Hybrid routing**

**Proactive routing**– This algorithm focuses to keep invariable and up to date routing message between each and every pair of nodes in the network by dedicated propagating path updates at definite time intervals. The proactive routing protocol attains the network topology before a petition comes in for forwarding. Since the proactive routing algorithms retain routing tables for

every nodes in the network, a route is found as soon as it is appealing. The advantage of these protocols is low latency in finding new path and contracts the end

Few proactive protocols are Cluster Head Gateway Switch Routing Protocol (CGSR)[2] DestinationSequenced Distance Vector (DSDV) [2], Optimized LinkState Routing (OLSR) [2], WirelessRoutingProtocol(WRP)[2]and Topology, Based Reverse Path Forwarding (TBRPF) [2] Protocols.

**Reactive Routing**- It is also requested ondemand routing algorithms frame a route to a given destination only when a node employ it by initiating a route finding process. Once a route has been implanted, the node keeps it until the destination is no longer accessible, or the route becomes unavailable The reactive routing protocol becomes active only when a node asks to forward a request.Reactive protocols make to have better efficiency than proactive protocols in case of control overhead and power consumption because paths are only bring into existence when there appeared some need for them . Few exampleof the reactive routing protocols are Ad Hoc Demand DistanceVector Routing Protocol (AODV) [2],Dynamic Source Routing Protocol (DSR) [2], Ad HocDemand DistanceVector Routing Protocol (AODV) [2]

**Hybrid Routing**–Hybrid routingsuch as ZRP [3]. ZRP is the available as self-organizing and self-configuring protocol without a much load on the network.Hybrid ones employs the merits of both proactive and reactive techniques. The proactive scheme is exploited for all the nodes within the radius of the zone which is the determined by hop count (HC) and the reactive scheme is utilized for all the other nodes in the network excluding the nodes in radius of the zone

### 3) **ZRP**

ZRP is a hybrid routing protocolapplicable to a wide varietyof MANET [2]. ZRP uses the pair of proactive and reactive approach, the key parameter by which it can maintain a balance between two is zone radius.It was proposed to step down the control overhead of Proactive routing protocol and to lessen the latency of Reactive routing protocol. It is relevant for the

networks with ample span and diversified mobile patterns. The zone routing protocol can be utilized in many different network environments by setting proper zone radius.

### **3.1) Intra zone routing protocol**

The inner nodes of the zone use proactive routing. Here, each and every inner node of the zone records the routing instructions to the destination node DN in the routing table. When there is a routing request, the route to the DN is established by referring to the routing table. This is called intra zone routing protocol (IARP).

### **3.2) Inter zone routing protocol**

In ZRP, when the data transmission has to occur outside the zone radius, it is a reactive routing and is called inter routing protocol (IERP).

Our focus is on one common hybrid protocol, the Zone Routing Protocol (ZRP). BER-based approach of ZRP that adds quality control to all of the phases of path selection judgment. We need to find routes where packets have greater chances to reach their destination without several redundant retransmissions. Nodes with poor links (in terms of BER) are not included from the route request process. To know the effectiveness of our approach, we use simulation with realistic wave propagation and mobility models.

## **LITERATURE REVIEW**

### **Span of Research Work**

A number of journals and research papers published during the above span 2011-2014 have been studied. The different aspects of the problem were inspected.

**B. Sreedevi(2011)**, This paper presented a new term known as Partial Authority Node (PAN) which divides the load from cluster head and thereby executes intra-cluster routing adequately. A gateway node or a border node (BN) is also introduced here which are available for inter-cluster routing to trace the destination fluently. So, most of the load is divided among PAN and BN. The algorithm is calculated using Zone Routing Protocol by taking simulations in NS2 simulator and the results show the performance in terms of packet delivery ratio, throughput and lowered delay and hence it provides a good quality of service.

**RavillaDilli(May2012)**, Author proposed the power management problems in mobile nodes by utilizing modified Zone Routing Protocol (ZRP), which was simulated using NS2 simulator. Since, most of the mobile nodes in the network are fitted with deficient power batteries, so, it could be difficult for a mobile device to sustain for a long period if it send and receive data more frequently

**TiguianeYelemouxz(2012)**, Author presented a Binary Error Rate (BER) based approach of ZRP (BER-ZRP). With BER-ZRP, all stages of link-state recording and routing tables evaluation provides lower Quality of Service control so that better routes in terms of BER are preferred. The overhead generated by route maintenance and route discovery processes is better managed. This approach empowered to improve ZRP Packet Delivery Ratio and Normalized Oversize Load

**AnushaPriyadharshini , Rashmi MR(2012)**, This paper describe the topic based on diminishing the delay and magnifying the lifetime of event-driven wireless sensor networks, for which events occur rarely. In such systems, most of the energy is dissipated when the radios are active, waiting for an arrival to take place. Sleep-wake scheduling is an efficient mechanism to prolong the lifetime of these energy-constrained wireless sensor networks.

**SatyaBhushanVerma(July 2013)**, This paper presents the energy efficient routing in mobile adhoc network using Zone Routing Protocol (ZRP) and any cast addressing and we too simulate using NS2 simulator. The zone routing protocol act as hybrid routing, that is pair of proactive (table driven) and reactive (on demand) techniques to maintain remarkable routing in the ad-hoc network.

**RuchiAggarwal(2014)** Author proposed the energy efficient routing in mobile adhoc network using Zone Routing Protocol (ZRP) and anycast addressing and we also simulate exploiting NS2 simulator. The zone routing protocol operate as hybrid routing, proactive (table driven) and reactive (on demand) methodology to gives scalable routing in the ad-hoc network.. EEZBLAR gives reduction in the energy absorption of the mobile nodes batteries by limiting the path finding process only to particular nodes. In EEZBLAR, network splits into zones and each zone is furnished with a zone Leader which keep pace of all the nodes in the zone in the form of a table. When route establishing process is begin, instead of flooding RREQ packets to the whole area of the network, the RREQ packets are transmitted only to the zone leaders. The zone leaders conserve routing table which have records of all the information about its zonal nodes.

**Shveta(2014)**, Author proposed that Zone Routing Protocol is based on the concept of the zone radius. A routing zone is defined for each and every node and also defined for the zones of neighboring node overlap. The main objective is to study methods to reduce the power consumed using ZRP protocols.

**M.Saravanan&D.Jagan(2014)**, This paper proposed neighbor coverage based probabilistic rebroadcast protocol (NCPR) for reduction of routing overheads in MANETs. They use SBA and NCPR for finding paths. Since pair of proactive and reactive concept is used, it performs better for finding routes and the simulation result shows that the latency time is diminished.

**R. Shanthi(2015)**, Author proposed a Hybrid approach of determining the optimal path in finding routes known as SZRP, Protocol is designed to consider the real traffic. For heavy traffic zone, proactive is favorable. For Low traffic zone, reactive is favorable.

| Study                                   | Year | Technique Used  | Conclusion  |
|---|------|---|---|
| B.Sreedevi&Dr.Y.Venkataramani           | 2011 | Implementation of ZRP for Heterogeneous Hybrid Cluster Routing to Support QoS in Mobile Ad hoc Networks | Throughput improves for inter-cluster and intra-cluster Routing                     |
| RavillaDilli, & PuttaChandrShekar Reddy | 2012 | Energy Management using modified ZRP  | A New method was proposed to reduce the power consumption using ZRP protocol        |
| TiguianeY´el´emouzz, & Philippe Meseure | 2012 | BER based approach with ZRP   | Introduce BER to quantify link quality & modify ZRP protocol for more efficient use |

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|                                |      |  | of network capabilities.  |
| AnushaPriyadharshin&Rashmi M R | 2012 | Any cast forwarding schemes for minimizing the expected packet-delivery delays from the sensor nodes to the sink.                  | reduce the event-reporting delay and to prolong the lifetime of wireless sensor networks employing asynchronous sleepwake scheduling.           |
| M.Saravanan & D.Jagan          | 2014 | A Neighbor Knowledge with Zonal Routing Protocol to Reducing Routing Overhead in MANETs  | Proposed ZRP to reduce the routing overhead and latency Time in MANETs.   |
| SatyaBhushanVerma              | 2014 | Energy Efficient Routing in MANET with ZRP and ANYCAST addressing  | ZRP with anycast then energy consumption is less than simple ZRP and average end-to-end time delay is also reduce                               |
| RuchiAggarwal & AmanpreetKaur  | 2014 | Energy Efficient Zone Based Location Aided Routing (EEZBLAR) Protocol for MANETs that is based on the Location Aided Routing (LAR) | Reduction in energy consumed in the mobile nodes batteries by limiting the area of discovering a new route to a smaller number of nodes.        |
| R. Shanthy                     | 2015 | SZRP - Hybrid approach of determining the optimal path in finding routes in MANET  | Protocol is designed to consider the real traffic. For heavy traffic zone , proactive is favorable. For Low traffic zone, reactive is favorable |

## CONCLUSION

In this paper various approaches of ZRP has been presented by its functionality and mobility model and various enhancements of existing ZRP such as BER based approach which quantify link quality & modify ZRP protocol, (EEZBLAR) based on LAR Reduces energy consumed in the mobile nodes batteries, Neighbor Knowledge with ZRP to Reduce Routing Overhead and latency in MANETs

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