

A Review of Backup Routing Protocol for Wireless Mesh Network

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ABSTRACT

The popularity of wireless network is increasing day to day due to dynamic infrastructure and on demand routing protocol. For the transferring of data in wireless mesh network used routing protocol. In mobile wireless network two types of routing protocol are used one is table driven and other is on demand routing protocol. The on-demand routing protocol provide two types of protocol one is multi-cast routing and other is unicast routing protocol. In this paper there is a review of routing protocol used in mobile wireless network. The process of path discovery and route establishment takes more time during the mobility of node. Now a day's various authors proposed a backup routing protocol. The backup routing protocol used AODV routing protocol.

Keywords:-Wireless Network, AODV, Backup Routing SBP, MANET.

INTRODUCTION

During the last few years we have all witnessed steadily increasing growth in the deployment of wireless and mobile communication networks [1]. Mobile ad hoc networks consist of nodes that are able to communicate through the use of wireless mediums and form dynamic topologies. The basic characteristic of these networks is the complete lack of any kind of infrastructure, and therefore the absence of dedicated nodes that provide network management operations as do the traditional routers in fixed networks. In order to maintain connectivity in a mobile ad hoc network all participating nodes have to perform routing of network traffic [5]. The cooperation of nodes cannot be enforced by a centralized administration authority since one does not exist. MANETs are also capable of handling topology changes and malfunctions in nodes through network reconfigurations. Examples include on-the-fly conferencing applications, networking intelligent devices or sensors etc. Interest in such dynamic wireless networks is not new. They supported automatic route set up and maintenance in a packet radio network with moderate mobility. Routing protocols in packet-switched networks traditionally use either link-state or distance-vector routing algorithm. Both algorithms allow a host to find the next hop neighbor to reach the destination via the "shortest path." The shortest path is usually in terms of

the number of hops; however, other suitable cost measures such as link utilization or queuing delay can also be used. Such shortest path protocols have been successfully used in many dynamic packet switched networks. In order to facilitate communication within the network, a routing protocol is used to discover routes between nodes. The primary goal of such an ad-hoc network routing protocol is correct and efficient route establishment between a pair of nodes so that messages may be delivered in a timely manner. Route construction should be done with a minimum of overhead and bandwidth consumption. An Ad-hoc routing protocol is a convention or standard that controls how nodes come to agree which way to route packets between computing devices in a MANET. In ad-hoc networks, nodes do not have a priori knowledge of topology of network around them, they have to discover it. Section-II gives the characteristic of mobile adhoc network. In section III related work. In section IV discuss the backup routing protocol. Finally, in section V conclusion and future scope

II CHARACTERISTICS OF MANET

Characteristics of mobile ad-hoc network are self-organizing, multi-hopping, mobility, scalability, security, energy conversation and autonomous devises which makes MANET suitable for up-coming needs while at the same time adds complexity to the protocols to be design.

1	Autonomous Devices	Some of the popular ad-hoc network applications require autonomous robotic components. All nodes in a generic network should of course capable of autonomous networking.
2	Self-Organizing	The ad hoc network must autonomously determine its own configuration parameters including addressing, routing, position identification, power control etc. In some cases, special nodes (e.g. mobile backbone nodes) can coordinate their motion and dynamically distribute in the geographic area to provide coverage of disconnected islands.

3	Mobility	The fact that nodes can be rapidly repositioned and/or move in the ad-hoc networks. Rapid deployment in areas with no infrastructure often implies that the users must explore an area and perhaps form teams/swarms that in turn coordinate among themselves to create a taskforce or a mission. We can have individual random mobility, group mobility, motion along preplanned routes etc. The mobility model can have major impact on the selection of a routing scheme and can thus influence performance.
4	Multi-hopping	A multi-hop network is a network where the path from source to destination traverses several other nodes. Ad hoc networks often exhibit multiple hops for obstacle negotiation, spectrum reuse and energy conservation.
5	Security	Mobility implies higher security risks such as peer-to peer network architecture or a shared wireless medium accessible to both legitimate network users and malicious attackers. Eavesdropping, spoofing and denial-of-service attacks should be considered.
6	Topology maintenance	Updating information of dynamic links among nodes in MANETs is a major challenge.

Table: 1: Characteristics of MANET.

Classification of routing protocol in mobile ad-hoc network.

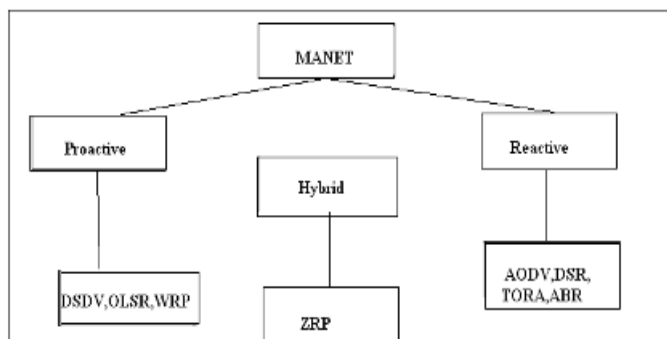


Figure 1: Classification of Routing Protocols in manet.

Routing is the process of finding a path from a source to destination among randomly distributed routers. The broadcasting is inevitable and a common operation in ad-hoc network. It consists of diffusing a message from a source node to all the nodes in the network. Broadcast can be used to diffuse information to the whole network. It is also used for route discovery protocols in ad-hoc networks. The routing

protocols are classified as follows on the basis of the way the network information is obtained in these routing protocols.

III RELATED WORK

In this section discuss the related work in the field of backup routing protocol for wireless mobile network. Here discuss some issue of protocol in terms of mobility and modification of routing protocol.

Jih-ching Chiu, Chun-Yao Zheng, Yao-Chin Huang Kai-Ming Yang Et al.[1] Author in this paper present A routing protocol is proposed with sequential repair and backup routing protocol (Ad Hoc On-Demand Distance Vector Routing-Sequential Repair and Backup Routing Protocol, AODV- SRBR Protocol), that can reduce the number of transceivers and have a stable connection. In the proposed routing protocol, the node of network can create multi-route message through decoding the path information of packets. When the link is broken, the proposed protocol can repair the data transmission by sequential repair or select backup routing.

Shubat S. Ahmeda , Eman A. Et al. [2] In this paper, they discuss transmission time and interference aware metrics are used as the default metrics for single radio and Multi-radio AODV routing protocols respectively. The two routing protocols have been implementing in mesh wireless test bed consisting of up to 200 mesh nodes, using OMNeT Simulation tool. It has been demonstrated that multi-radio AODV routing protocol with AWARE metric, gives better performance in terms of end to end delay, packet loss and throughput. Wireless Mesh Networks (WMNs) have emerged as a key technology for next-generation wireless networking. Routing in WMNs is challenging because of the unpredictable variations in the wireless environments.

Ozger Oyman, J. Nicholas Laneman, Sumeet Sandhu Et al. [3] Author in this paper discuss and summarize capacity results to show merits of multihop relaying in broadband cellular mesh networks. Under the guidance of these results, they provide design perspectives on relay deployment, spectrum allocation and end-to-end optimization of certain QoS measures such as throughput, coverage, reliability and robustness. They conclude with an overview of recent standardization activities and remarks on remaining open problems and design challenges.

S. A. Ade, P.A.Tijare Et al.[4] In this paper presents a Mobile ad hoc networks (MANET) represent complex distributed systems that comprise wireless mobile nodes that can freely and dynamically self organize into arbitrary and temporary ad hoc network topologies. A mobile ad hoc network is a collection of nodes that is connected through a wireless medium forming rapidly changing topologies. The widely accepted existing routing protocols designed to accommodate the needs of such self-organized networks do not address possible threats aiming at the disruption of the protocol itself.

Arun Kumar B. R., Lokanatha C. Reddy, Prakash S. Hiremath Et al.[5] In this paper they present their observations regarding the performance comparison of the

above protocols for VBR in mobile ad hoc networks (MANETs). They perform extensive simulations, using NS-2 simulator. Their studies have shown that reactive protocols perform better than proactive protocols. Further DSR has performed well for the performance parameters namely delivery ratio and routing overload while AODV performed better in terms of average delay. The Efficient routing protocols can provide significant benefits to mobile ad hoc networks, in terms of both performance and reliability.

Xiaoxia Huang and Yuguang Fang Et al.[6] In this paper, they discuss on utilize the multiple paths between the source and sink to provide a solution satisfying the delay requirements of different traffic types. In dense wireless sensor networks, this is feasible because numerous paths exist between a source node and the sink. They propose a model for multipath routing, followed by detailed explanation of their routing protocol PRIMAR (prioritize Multipath Routing). Simulation results demonstrate the effectiveness of PRIMAR.

Viet Thi Minh Do , Lars Landmark ,Oivind Kure Et al.[7] In this paper author present a survey on Quality of Service (QoS) in multicast ad hoc networks uses a framework based on the mechanisms in three important elements resource estimations, multicast tree/mesh administration, and multicast routing. Their contribution is an exploration of the design space and an identification of areas that have not been fully explored. They discuss the design space of central mechanisms and classify proposed QoS multicast schemes according to the mechanisms they used.

Stephane Roch Et al.[8] They discuss Wireless Mesh Network is a breakthrough architecture that represents a new way of thinking about wireless local area networks (WLANs), bringing significant benefits to end users, enterprises, and service providers alike. For end users and enterprises, Wireless Mesh Network extends wireless coverage across a much larger area beyond traditional "hot spots" such as airports and Internet cafés, and beyond the conference rooms and kiosks of enterprise campuses. For service providers, Wireless Mesh Network's inherent wireless backhaul to the wired broadband network used in lieu of expensive cabling or leased facilities can dramatically reduce installation time, as well as save up to 75 percent in installation and commissioning costs and up to 70 percent in operating expenses.

Chun-cheng Chen , Chandra Chekuri Et al.[9] In this paper, they propose GPSR, an efficient and near optimal algorithm for addressing urban wireless mesh network planning problem. GPSR is based on the greedy pre-selection/post-selection of high profit nodes and a 2 approximation algorithm GPSR-HELPER that solves a provably good linear program. It not only maintains high profits and constrained costs for the mesh deployment but also provides robust and fault-tolerant networks. In the case of failure in finding a feasible solution, GPSR is always able to find an alternative with bounded costs. Furthermore, GPSR can easily be extended for different practical situations such as asymmetric links, high robustness requirements, heterogeneous

vertex/edge costs, and various profit functions. Through extensive evaluation, we have shown that GPSR consistently approaches optimality under various parameter settings.

Manmeet Kaur, Amandeep Kaur Virk Et al.[10] In This paper author presents and Improved Multicast AODV (IMAODV) routing protocol with limited source routing that ensures giving on-time, reliable and accurate data in V2V communication as compare to Improved AODV (IAODV). In result analysis, performance of the proposed IMAODV protocol is compared with AODV, IAODV and MAODV protocol in terms of Average End-to-End Delay (Avg. E-to-E Delay), Packet Loss Ratio (PLR), Packet Delivery Ratio (PDR) and Normalized Routing Load (NRL). Simulation analysis results show that IMAODV protocol performs better than IAODV protocol in VANETs. Vehicular Ad-hoc network (VANET) is a collection of vehicular nodes forming a temporary network without the aid of any centralized administration or infrastructure.

IV SBP PROTOCOL

The secured backup routing protocol work in three phases all phase discuss here.

1. Secured route discovery across the nodes.
2. Back up node setup.
3. Route maintenance across the nodes.

It requires three kinds of cache, RD request cache, Backup route cache and Fresh route cache [9]. The RD request cache of a node is used to store temporary routing information in the route discovery phase. The Backup route cache is used to store back-up routes. The Fresh route cache is used to store the secured fresh routes after a data transmission process is finished. A Secured Route Discovery across the nodes when source node S requires the route to destination D, S enters the route discovery phase and checks whether adequate routes to D are already available in the Fresh route cache. If some routes to D in Fresh route cache are found, S runs Route confirms process. Otherwise, S runs new secured route discovery process to find a secured new route to the destination node.

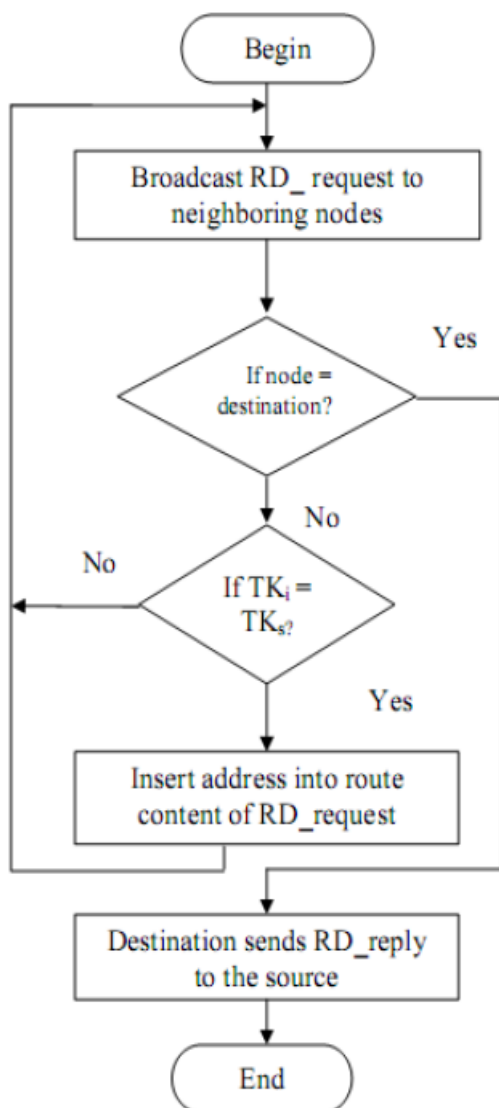


Figure 2: Secured route discovery process with trust key.

V CONCLUSION & FUTURE WORK

In this paper we discuss the routing protocol of mobile adhoc network routing schemes. We have also provided a classification of these schemes according the routing strategy i.e., table driven and on demand. We have also presented a comparison of these two categories of routing protocols, highlighting their features, differences and characteristics. Finally we have identified possible applications and challenges facing ad-hoc wireless networks. , each protocol has definite advantages and disadvantages and has certain situations for which it is well suited. The field of ad-hoc mobile networks is rapidly growing and challenging, and while there are still many challenges that need to be met, it is likely that such networks will see wide-spread use within the next few years.

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