

Survey on Load Aware and Energy Aware Routing in MANET

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Abstract: A more challenging goal in a MANET is to provide energy efficient routes because nodes life time is the most critical limiting factor. It will prevent the network from being partitioning and helps nodes from being sinking down. This paper classifies the energy aware routing protocols for MANETs. They minimize either the active communication energy required to transmit or receive packets or the inactive energy consumed when a mobile node stays idle but listens to the wireless medium for any possible communication requests from other nodes. The life time of MANET is totally depends upon battery of each node. So the paper empathizes on increasing the battery life. There are many energy efficient routing protocols available. Hence it is not defined that which particular protocol is best suited for given network. The purpose of this paper is to facilitate the research efforts in combining the existing solutions to offer a more energy efficient routing mechanism. Initial energy of node determines the behavior of the network. It works perfectly at lower initial energy of nodes.

Keywords: MANET, Routing Protocol, DSR, Node Energy.

1. Introduction

MANET Stands for "Mobile Ad Hoc Network." A MANET is a type of ad hoc network that can change positions and arrange itself on the fly. Because MANETS are mobile, they use wireless connections to connect to various networks. This can be a standard Wi-Fi connection, or another medium, such as a cellular or satellite communication. Some MANETs are limited to a local area of wireless devices (such as a bunch of laptop computers), while others may be connected to the Internet. For example, A VANET (Vehicular Ad Hoc Network), is a type of MANET that allows vehicles to communicate with roadside equipment. While the vehicles may not have a directly connected to Internet, the wireless roadside equipment may be connected to the Internet, allowing data from the vehicles to be sent through the Internet. The vehicle data may be used to measure traffic conditions or keep track of trucking fleets. Because of the dynamic nature of MANETs, they are normally not very secure, so it is important to be careful what data is sent over a MANET. And Frequently it will be changed and update links to further devices. The traffic forward separate with the help of router. They may hold one or multiple and different transceivers between nodes. MANETs consist of a peer-to-peer, self-forming, self-healing network in contrast to a mesh network has a central controller (to control, improve, and allocate the routing table).

Routing: In networks, does routing mean selecting best path? The term "Routing" has been used traditionally to indicate forwarding of network traffic between networks. This process of routing is done for several types of networks, including, the telephone network (circuit switching), electronic data networks and transportation networks. In packet switching networks, routing forwards packets over intermediate nodes. Intermediate nodes may include routers, bridges, gateways, firewalls or switches, these are network hardware devices. The process of routing

maintains a routing table record to several network destinations. Therefore, constructing routing tables is very important for efficient routing.

Reactive protocols – AODV In on-demand driven routing, routes are discovered only when a source node desires them. Routing has a two main techniques: route discovery and route maintenance. The route discovery is the process of sending route request packet from a source to its neighbour nodes, which then forward the request to their neighbours, and so on. After the route request packet reaches the destination node, it reply's by a reply packet through the neighbour from which it first receive the request packet, and this reply is in the same way propagated to the source node. Also when the route-request reaches an intermediate node that has a sufficiently up-to-date route information, it stops forwarding and sends a route-reply message back to the source.

RREQ- A routing message is transferred by a node needing a routing to a node. As an optimization AODV routines an increasing ring method while overflowing these message. All RREQ transfers a time to live (TTL) value that conditions for how many steps this message must be sent.

RREP - A route reply message is unicasted back towards the inventor of a RREQ if the receiver is each the node using the demanded address, or it has a usable route to the demanded address. The goal one be able to unicast the message back, is that each route progressing a RREQ caches a route back to the inventor.

RERR - Nodes observer the link position of following steps in active routes. Once a link breaking in an active route is identified, a RERR message is used to alert extra nodes of the damage of the link.

2. Proactive Protocols – OLSR

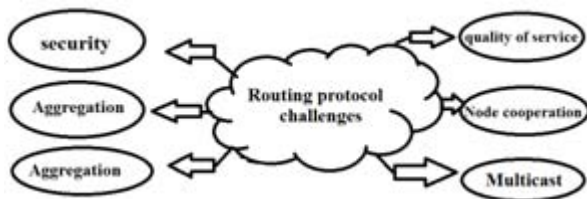
With table-driven routing protocols, each node challenges to maintain reliable, up-to-date routing information to all further node in the network. This is finished in answer to changes in the network by consuming each node update its routing table and broadcast the updates to its adjacent nodes. Thus, it is proactive in the logic that when a packet wants to be progressed the route is already known and can be nearly used. Many routing protocols with Destination-Sequenced Distance Vector (DSDV) and Fisheye State Routing (FSR) protocol fit to this grouping, and they differ in the number of routing tables operated and the systems used to interchange and maintain routing tables. [1]

OLSR defines three basic types of control messages:

HELLO - HELLO messages are transferred to all neighbours. These messages are used for neighbour detecting and MPR calculation.

TC - Topology Control messages are the link state indicating finished by OLSR. This messaging is enhanced in several methods using MPRs.

MID - Multiple Interface Declaration messages are transferred by nodes successively OLSR on more than one interface. These messages lists all IP addresses used by a node. [1]



What I am doing in this paper?

In this paper, we define a new protocol those aware aimed at low energy. The knowledge behind the protocol is very simple using the lowest energy route continuously is not necessarily best for the long duration health of the network. We plan a network the device are consuming limited quantity of battery power and computational properties. Thus in this offered work in instruction to increase of these resource are difficult task. We propose routing method is executed by the AODV routing protocol. Which calculate the energy and resources for improving the show in terms of routing overhead and energy consumption. By probabilistic forwarding to send traffic on different routes offers an easy way to use several tracks without adding much complexity or state at a node. They have upcoming generation technology it offer cost less communication stability form individual node to another.

3. Background

Performance Challenges of Routing Protocols

There are different routine tasks of routing protocols in the MANET as clarified below.

Security Mobile ad-hoc networks knowledge a radio environment that is not committed then is not safe posing a

safety risk to the network constancy. As the traffic is forward through different nodes therefore traditional safety methods such as cryptography, include is inefficient to confirm the security.

(1.3) Quality of Service (QoS) The quality of the connection remains changeable through the connectivity time of ad-hoc networks, thereby the quality limits are more challenging to be maintained. So the means to 32 detect and troubleshoot the items of above declared parameters need to be optimized in order to confirm the quality of service to end users.

(1.4) Scalability The scalability challenge appears when the performance of routing protocol in ad-hoc network is tested by increasing the network size. The dynamic environment of wireless ad-hoc network poses big challenge to cater the huge amount of broadcast traffic in change of topology.

(1.5) Saving Energy Due to the mobile nature and environmental variations saving the energy of the network has been a desired feature. As the infrastructure in ad-hoc network is not fixed, thereby increasing the overhead data that results in more consumption of transmitted power.

4. Literature Survey

By a low energy path normally hints to energy reduction of the nodes beside that route and in the wickedest situation may main to network divider. To complete this, multiple paths are originated between source and destinations, and every path is allocated a chance of existence selected, conditional arranged the energy metric. Each interval data is to be sent from the source to destination, one of the routes is casually selected conditional scheduled the probabilities. This means that no one of the tracks is used all the time, avoiding energy reduction. Also dissimilar tracks are tried continuously, improving easiness to nodes moving everywhere in the network. The idea behind the protocol is very simple by the lowest energy path continuously is not certainly greatest for the long-term condition of the network. Using probabilistic forwarding to send traffic on different routes offers an easy method to use multiple paths without count much complexity.[2]

In MANET networks nodes are working in the presence of limited energy, to reduce energy consumption which require energy efficient routing.

Nodes are in network are working in the presence of limited energy then energy efficient routing is necessary for reducing energy consumption. Now location aware DREAM protocol is reduces the energy consumption because due to the awareness of location less number of routing packets are flooded in the network by that energy consumption are reduces. Mobile device ad hoc network should be able to detect the presence of other devices and perform necessary set up to facilitate communication and sharing of data and service. Mobile Ad hoc networks are generally more susceptible to fixed or hardwired networks in term of battery energy. This paper has light on different energy based concepts of MANET that based on energy consumption and location based energy efficient routing, that can help to observe the usefulness of different research concepts. [3]

A wireless sensor network consists of light-weight, low power, small size of sensor nodes. Due to the low-cost of these nodes, the deployment can be in order of magnitude of thousands to million nodes. The sensor nodes perform desired measurements, process the measured data and transmit it to a base station, commonly referred to as the sink node, over a wireless channel. Nodes in sensor networks have restricted storage, computational and energy resources; these restrictions place a limit on the types of deployable routing mechanisms. Sensor networks can be divided in two classes as event driven and continuous dissemination networks according to the periodicity of communication. Routing protocols are usually implemented to support one class of network, in order to increase energy savings. This protocol uses the metrics received signal strength and the available energy to identify an energy efficient path that minimizes packet collisions and increases the network lifetime. An optimal solution to this problem especially for mobile sensor networks is still an open question.[4]

The demands of multimedia service in daily life are enhanced greatly. Video on demand, video streaming, and VOIP have become the most prevailing real time application for a lot of people. Since these energy sources have a limited lifetime, power availability is one of the most important constraints for the operation of the ad hoc network. Communication is one of the main sources of energy consumption According to problem statement, very first we create mobile node and very first routing protocol as AODV routing for destination expected zone finding and set channel type as wireless channel, prorogation type two ray ground wave because mobile node contain routing table and also node radio range is limited so our data transmitted from node to node after that we apply MAC (media access control technique) as 802.16 Wimax that provides greater radio range as compare to 802.11 WLAN scheme our work proposed in Wimax scheme so here we elaborate Wimax network work flow architecture with step description one by one after that LAR module.[5]

Mobile Routing answering and routing maintained. When a node needs to send a message to another node, it broadcasts request packets to all adjacent nodes to initialize the discovery process of route. Many copies of the same RREQ flood into the network and cause the broadcast storm. Since many redundant request packets are broadcasted by the neighbouring nodes, and a node may receive the packet more than once. If the entire intermediate node receives the RREQ and replay it at the same time, there will be competition and collision. When the mobility is low, compared with the method LAER, the delay of the proposed method is slightly high. [6]

In this case, an algorithm about how to evaluate link stability and energy efficiency and get the optimal route is a critical and hot issue in ad hoc networks. Different energy ratio has different probability to response the route request packet (RREQ). In route discovery, a node which located in stable zone of the upstream node responds to the RREQ and attach the calculated the link stability with trade off to the RREQ, in addition, forwarding the RREQ according to the energy information of the node. Simulation results showed that the novel proposed scheme significantly increases the packet

delivery ratio and reduces the number of routing failure and normalized control overhead. Although the delay is lightly increased, it is still in a good condition. [7]

5. Problem Domain

After literature study the following key issues addressed in this study is listed in this section. Limited energy and computational resources available therefore during communication a node can leave the network any time. Highly loaded node in network consumes more energy as compared to normal loaded node. Over loaded node can increase the control message discussion therefore the load on network nodes are desired to normalize. In this method we modifies the process of AODV route discovery, and selection process route based on the number of hops and SNR is feed backed. In the routing process, by measuring the obtained data packets of intermediate adjacent nodes and the SNR of control packets the link quality is monitored and maintained. [8]

6. Conclusion

Enhanced performance of routing protocol in relations of energy consumption. Improving control message exchange for improving the show in terms of routing overhead. This routing is controls a route only must shortest time, but since the control packets and routing are not applied, there is a waste of network resources. The routing information stored and maintenance, which can be classified as the first type, table-driven and reactive and on-demand hiring agreement. In the high-speed dynamic network, it shows higher performance. The main suggestions in works are offered and the main method s accepted for ad-hoc energy consumption decrease is clarified. The works offered are characterised by the environment of their performance: proactive, reactive and hybrid ones. In various cases, it is problematic to compare them directly since each process has a dissimilaraim with different moulds and employs different means to complete the goal. The energy-aware protocols' display is normally related with standard protocols, making difficult to compare the different planned results between them.

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