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A Survey on Energy Efficient Routing Protocol in MANET using AOMDV

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Abstract: The increase in availability and popularity of mobile wireless devices has lead researchers to develop a wide variety of Mobile Ad-hoc Networking (MANET) protocols to exploit the unique communication opportunities presented by these devices. Mobile Ad hoc network (MANET) is a set of two or more nodes that is used for wireless communication and networking capacity. Mobile Ad-hoc Network (MANET) consists of wireless mobile nodes that dynamically form a temporary network without depending on any fixed infrastructure. This research uses the AOMDV routing protocol. In this paper we investigate the range of MANET routing protocols available and discuss the functionalities of several such as Ad-hoc On-demand Distance Vector (AODV), Ad-hoc On-demand Multipath Distance Vector(AOMDV) are proposed.

Keywords: Energy Efficiency,MANET, AOMDV,AODV

I.INTRODUCTION

MANET is an independent system which consists of a set of mobile nodes which can be implemented by using various techniques like Bluetooth or WLAN[2].Mobile Ad Hoc Networks (MANET) are networks that use their nodes to send and receive existing packets. Nodes in MANET are dynamic MANET networks that can be built without using the infrastructure. MANET has three types of routing protocols, namely reactive, proactive, and hybrid protocols. The reactive protocols are also known as on-demand (on demand), which are protocols that send data from source to destination only when needed. The proactive protocol is a protocol that always regulates the delivery of packets to the destination whether it is needed or not. The hybrid protocol is a combination of reactive and proactive protocols, the system begins with the prospect of proactive and then serves on-demand from nodes such as reactive protocols[1]. MANET can also useful in Personal Area Network to share information between devices like laptops, mobile phones etc. These devices create a network to share the information to and from each other[3].

Characteristics of MANET :

- Easy installation
- Communication via wireless network
- No infrastructure needed
- Dynamic network topology
- Nodes perform roles of both hosts and routers
- Can be set up anywhere
- Flexible

Applications of MANET :

- Military application (Soldiers, tanks, planes)
- Personal area networking (cell phone, laptops)
- Civilian environments (meeting rooms, sport stadiums)
- Emergency operation (search and rescue operations, firefighting)
- Wireless mesh networks, wireless sensor networks, etc.

II. BACKGROUND & RELATED WORK

Routing protocols are required in network for deliver packets from source to destination.One of the main parameters considered in the node is power. In Mobile Ad hoc Network (MANET) all the nodes are mobile in nature having

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limited battery capacity that is called energy. Because of the dynamic behavior of network link are not maintained for long time. Each device in a MANET is free to move independently in any direction, and will therefore change its links to other devices frequently. AOMDV finds a route between source and destination by a route discovery process by creating a more extensive AODV protocol.

In this section, we study various Energy Efficient Routing Protocol based on AODV in MANET which are proposed in the literature that reduce energy consumption, increasing network lifetime, provide efficient delivery of data packet and longer battery life. Various Protocols have been proposed for MANET. All of the MANET routing methods have advantages, disadvantages and scope for further research.

III. LITERATURE SURVEY

Bhavna Sharma, Shaila Chugh, Vismay Jain[5] proposed a scheme which could consider energy conservation, shortest path and load balancing, In this routing scheme, we would consider both the shortest path and the energy conservation in multipath way with proposed energy based multipath routing (E-AOMDV). We define an energy factor as that we will use the products of the energy factors of all the nodes along different paths as the selection criteria. The energy factor informs about the status of energy then here we evaluate the performance of AOMDV and energy based AOMDV (E-AOMDV).

S. B. Nalina, K. Sumathi [6] investigate the range of MANET routing protocols available and discuss the functionalities of several such as Ad-hoc On-demand Distance Vector (AODV), Ad-hoc On-demand Multipath Distance Vector(AOMDV) and improved AOMDV named as Ad-hoc On-demand Distance Vector with Fitness Function (FF-AOMDV) are proposed. Mobile Ad-hoc Network (MANET) consists of wireless mobile nodes that dynamically form a temporary network without depending on any fixed infrastructure. MANET's are distributed and the routing functionalities are carried out by mobile nodes. Energy consumption is considered as one of the major challenge as the mobile nodes do not possess permanent power supply and they rely on batteries.

SANDYA N. V. , NALINA S. B.[7] highlights the protocols in MANET which acts as solution to the energy consumption problems. In this paper the reactive MANET protocols; Ad-hoc ondemand Distance Vector (AODV), Ad-hoc on-demand Multipath Distance Vector (AOMDV) and improved AOMDV named as Ad-hoc On-demand Distance Vector with Fitness Function (FF-AOMDV) are proposed.

Naif D. Alotaibi, Elyas I. Assiri [8] proposed an effective method Balanced and Energy Efficient Multipath Routing with Robust Transmission in MANET. It is shown that the limitations are crossed in MANET. The comparison of FFAOMDV, AAOMDV and AOMRLM is done and proved that FFAOMDV is the best protocol used for this mechanism. This research also maximizes the connections and minimizes theerrors in all the levels.

Siti Ummi Masruroh,Angga Zain Sauqy Perdana,Hendra Bayu Suseno,Andrew Fiade,Dewi Khairani,Husni Teja Sukmana [9] One of the main parameters considered in the node is power. Power is limited for the nodes in MANET, which is used for some operations where the node energy is not exhausted. main problem lies in energy-efficient experiments using the AOMDV routing protocol in the presence of malicious nodes using packet loss, jitter, throughput, and energy parameters. Therefore, this study will examine the AOMDV routing protocol based on the parameters of throughput, jitter, packet loss, and energy [7] on the Mobile Ad-Hoc Network based on the number of malicious nodes and based on the total number of different
nodes.

IV. OVERVIEW OF AODV ROUTING PROTOCOL

In this section we study about Ad hoc On Demand Distance Vector (AODV) Protocol which is designed for use in MANET. AODV is a Reactive Routing Protocol, so the route is established based on requirement. Working of AODV is based on DSDV and DSR. It is used less number of broadcast by establishing routes based on demand and it does not maintain route to every node to every other node in network. The AODV discovers routes on as requirement basis using a route discovery with one entry per destination[4].

(1) Route Discovery

AODV initiate the route discovery procedure with two messages (1) Route Request (RREQ) (2) Route Reply (RREP). The source node create the RREQ message with its IP address, Destination IP address, its sequence number, the destination last sequence number, and broadcast ID.

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When source node wants to send a packet to destination node, it will start with broadcasting of RREQ to its neighbors for certain destination. After receiving RREQ message from intermediate node, it checks its routing table for route to destination. If yes, sends RREP to source. If No, it rebroadcast to its neighbor node. It will then set up revers path to source node in its route table. It ignores RREQ if it is processed already.

(2)Route Maintenance Stage

A route maintenance procedure is required, if any intermediate node moves, neighbor node can detect the link failure and send the link failure notification to its upstream neighbor. These nodes propagate the Route Error (RERR) to their predecessor nodes.

Benefits and Limitations of AODV :

The benefits of AODV protocol is, it is supports both unicast and multicast packet transmission even for nodes in constant movement. When topology is failure then it is gives the responds very quickly. It is does not put any additional overhead on data packets. AODV Routing Protocol are required limited memory space for maintain active routes and also increasing the performance of network. The limitation of AODV protocol, for wide network it is not suitable. It is does not support asymmetric link and does not perform well.

V. CONCLUSION

As we have presented some protocols which works on MANET and AODV.Here, we came to a conclusion from present scenario that proper management of implementation, its execution, and protocol we can do much better and deliver fast and efficient solution for proper execution in the adhoc network. We have discussed benefits and limitations of AODV.We have also discussed applications and characteristics of MANET.

VI. FUTURE WORK

The future work can be extended with high throughput and higher rate of transmission. Try to reduction of load in the network by increasing the lifetime of the network.

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