International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 03 Issue: 08 | Aug -2016 www.irjet.net p-ISSN: 2395-0072

OVERALL IMPACT OF DIFFERENT NETWORK SIZE ON MANET ROUTING PROTOCOLS

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Abstract: Mobile Computing is a technology that allows transmission of data, voice and video via a computer or any other wireless enabled device without having to be connected to a fixed physical link. MANET routing protocols play vital role to deliver packets data from one end to another end i.e. source to destination. The fundamental characteristics on which the effectiveness of data communication in MANET network depends on Delivery rate, Accuracy, Timeliness. These characteristics effects with different MANET network size. Small network means having few MANET nodes, overall performance would be different than large or medium .In this Review paper we will discuss different Routing protocols like AODV,OLSR and GRP and also will analyze the overall effect of different network size with different Routing Protocols .

Keyword: AODV, OLSR, GRP, ACCURACY, DELIVERY RATE.

1. Introduction:

A MANET is a group of mobile Nodes which shares a wireless channel even with decentralized control or without having established communication backbone. MANET is an individual glance system of mobile devices which are connected by ad hoc wireless links. All nodes, in the system cooperate in order to rectified route packets in multi-hop forwarding mode with effect of the unexpected mobility of Node the network topology might change constantly. Ad-hoc means "for one specific purpose" MANET get this definition as they are formed when needed. All available nodes are known to other nodes within range. The whole collection of nodes is interconnected in much different style. Ad hoc networks are made and used as exactly in variant environments. Routing is one of the main tasks of networking to deliver data from one to the other node. Wireless ad-hoc networks are also known Mobile ad-hoc multihop networks without predetermined topology or central control. This is because MANET can be categorized as a dynamic, multihop, potentially rapid changing topology.

The objective of such networks is to provide communication abilities to areas with Limitations or not having existing communication Infrastructures. A MANET is usually built having mobile nodes using wireless communications. The nodes in MANET are connected together using multi-hop communication paths. This means that all nodes in the hop should be willing to participate in the process of delivering a packet by forwarding it from source to destination. It may has multiple paths by which the packets travel. A single file is divide into a number of data packets, and these packets are transmitted through different paths.

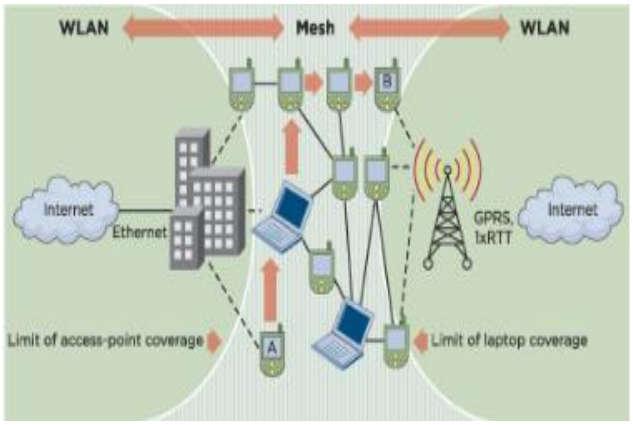

Figure: 1.1 working of MANET network

2. Classification of MANET Routing Protocols

There are a large variety of Routing Protocols, which implement vastly different Routing strategies. It is important for the routing and topology information to be kept up to date in such a dynamic environment. The means by which the information is updated is a major characteristic for classification. Figure 1.1 shows the general broad classification of Routing Protocols.

2.1 Reactive Routing Protocol
2.1 Proactive Routing Protocol
2.3 Hybrid: Both proactive and On-demand

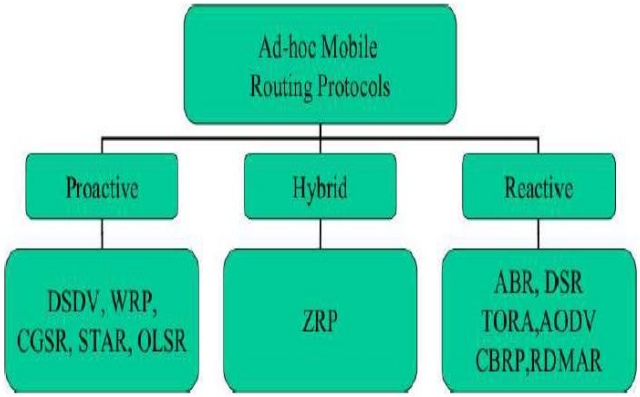

Figure: 1.2 Classification of Routing Protocols

2.1 Reactive Routing Protocol
Reactive routing protocol is also called on demand routing protocol. In Reactive routing protocol, route is determined whenever it is demanded, Nodes starts route detection on demand basis. Reactive routing is also called on-demand routing protocol till it does not maintain routing information or routing activity at the network Nodes if there is no communication. In Reactive routing protocol If a Nodes require to send a packet to another Nodes then this protocol searches for the route in an on demand manner and therefore it establishes the connection in order to receive and transmit the packet. The route detection take place by flooding the route request packets throughout the network. Examples of reactive routing protocols are the Ad-hoc On-demand Distance Vector routing (AODV), Location Aided Routing (LAR) and Dynamic Source Routing (DSR). Temporally-Ordered Routing Algorithm (TORA).

2.2 Proactive Routing Protocol
Proactive routing protocols responsible and maintain routes to all destinations, whether these routes are require or not. Whenever the network topology converts it leads the changes in routing tables and updated periodically. In order to maintain exact route data, A Node has to periodically send control messages. Resultant, proactive routing protocols might waste bandwidth till control messages are sent out unnecessarily if when there is no data congestion. The merit of this type of protocols is that hosts can quickly obtain route information and quickly formed a session. some familiar proactive routing protocols such as DSDV, OLSR.

2.3 Hybrid Routing Protocols
Hybrid Routing Protocols attached the merits of proactive and reactive routing protocols. The logic of hybrid protocols is using both proactive and reactive approaches, each one but with different objective. The network is splitting into smaller groups (or clusters).Then, a proactive paradigm is used to assemble information about nodes within the cluster, while a reactive paradigm is used for communications with nodes in distant clusters. Sending a packet within a cluster often act fast, and exchanged routing data is still rather small. Sending a packet out of a cluster will might take longer, but it should not happen as often, and the prohibitive bandwidth overflow is avoided. The other way is a much More complicated design and implementation of such a protocol. The complicated part is identifying how the clusters are made and handle the changes in the topology. The Zone Routing Protocol (ZRP) good examples in this category.

Table -1: Protocols Advantages & Disadvantages

Protocols	Advantages	Disadvantages
Reactive	Path available when needed overhead is low and free from loops.	Latency is increased in the Network.
Proactive	Information is always available. Latency is reduced in the network.	Overhead is high, Routing information is flooded in the Whole network.
Hybrid	Suitable for large networks and up to date information Available	Complexity increases

3. Performance effect Factor of network size:

The fundamental characteristics on which the effectiveness of data communication in MANET network depends on, those are Delivery rate, Accuracy, Timeliness. These characteristics may vary with different network size. Congestion rate, Delay, Throughput would vary with changes the network size. we will implement AODV,GRP and OLSR with small, medium and large network size .then we can analyze the research work with different Routing Protocols on Scalable Network size.

4 Literature Review

- **Sumit Mahajan, Vinay Chopra, February 2013.** In this paper, Authors discussed the three routing protocols (AODV, OLSR and TORA) based on OPNET simulations. Authors analyzed for different reactive and proactive ad-hoc routing protocols with different mobile nodes transmitting GSM voice traffic data. Finally it is concluded that the overall performance of OLSR is better choice for small and large networks.
- **Kiranveer Kaur, Surinderjit Kaur, Vikramjit Singh, March 2014.**In this paper the performance analysis of routing protocols AODV, DSR and OLSR protocols in MANET have been investigated. The investigation considers the impact of scalability, mobility and network. HTTP, FTP and Email and Video Conferencing heavy traffic load on different types of routing protocols is taken throughput of OLSR is higher than that of the reactive routing protocols AODV, DSR.
- **Manish Sharma, Gurpadam Singh, 2011.** OLSR outperforms the other protocols. This is because OLSR is a proactive protocol and it pre determines the route in well defined manner. It uses destination sequence numbers to ensure loop freedom at all times and it offers quick convergence when the network topology changes.
- **Gurpinder Singh, Jaswinder Singh, April 2012 .**In this research paper, an effort has been made to concentrate on the study of routing protocols OSPF, DSR, AODV, TORA, OLSR and DSDV on the basis of quantitative and qualitative metrics and also concentrate on common issues of MANET. Based on the Simulation analysis, we use DSR, AODV, TORA and we conclude that for 150 nodes TORA create less network load and throughput is high for AODV.
- **A.Parvathavarthini, Dr.S.S.Dhenakaran, February 2013 .**Authors effort has been made on the comparative study of Reactive, Proactive and Hybrid routing protocols has been presented in the form of table. There are various shortcomings in different routing protocols and it is difficult to choose routing protocol for different situations as there is tradeoffs between various protocols. There are various challenges that need to be met, so these networks are going to have widespread use in the future.

- **Harmanpreet kaur, Er. Jaswinder Singh October 2012.**In this paper, performance of three routing protocols namely OLSR, GRP and TORA was analyzed .OLSR performs best in terms of load and throughput.GRP performs best in terms of delay and routing overhead. TORA is the worst choice when we consider any of the four performance parameters. In summary, we can say that OLSR is best as compared to GRP and TORA in all traffic volumes since it has maximum throughput.
- **Sajjad Ali, Asad Ali" 2009 .**Authors presented the simulation research of their research having three routing protocols AODV, DSR and OLSR generated over MANET using FTP traffic determine its behavior in order to three metrics, delay, network load and throughput. They Analyzing routing protocols represented that the OLSR is good in MANET as per simulation results but it is not essential that OLSR operate usually good in whole networks, its behavior might differ by changing the network.
- **Kuldeep Vats , March 2012** As per simulation ,GRP protocol represented good behavior in the form of delay, total traffic sent and received, routing traffic sent and received in packet and bit form, packet copy, packet destroyed, packet created. It holds the exact result that's good for another networking application. As per simulation, it delivered the channel network in whole world in great manner and gives the located platform based security as security is the main issue for any ad-hoc network.
- **Pankaj Palta, Sonia ,July – 2012** Explanation based on Results is that the OLSR represent great result with that scenario Where bandwidth having more OLSR usually updated its nodes so large bandwidth is used as compared to TORA having same situation. It was concluded it has not retransmission efforts in OLSR but in TORA, it existed, represent the throughput is good in OLSR as compared to TORA as per results it represent that the OLSR was overall good

5. Conclusion

This paper deals with all the aspects of Routing Protocols such as AODV, OLSR and GRP. In this paper we analyze different type of MANET Routing Protocols and also we go through some factors that affect the overall performance of network. For future references we will create different networks with these routing protocols which will fulfill our research requirement that is small, medium and large network performance with these protocols. For this Research work we will use OPNET tool.

6. Reference:

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