



RESEARCH ARTICLE

Exploration to the Issues and Challenges Associated with Mobile Ad-Hoc Network

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Abstract: Mobile Ad-hoc Networks are wireless networks consisting of mobile nodes that communicate without base stations. Nodes in this networks generates the both user and application traffic and carry out the routing protocol, frequently changing bandwidth and power constraints, together poses a new issues in network. Here is this paper we will focus on various issues are explored.

Keywords – MANET, Energy Efficient, Delay

I. INTRODUCTION

MANET's is a self-configuration network that communicates without base stations. They must find routes and maintain communications wherever possible because of network topology changes constantly. Each node has its own power supply and power limitation that restrict the number of transmissions that can be used to spread widely on channels and network topology.

The energy efficient routing is the most important criteria for MANETs since nodes is powered by batteries with limited capacity. Power failure not only effects the node itself but it will also effects all over the network in the communication and network lifetime.

A mobile node consumes its battery not only when it is actively communicating with the packets also when it is in ideal state waiting for any further communication request from any other nodes. The performance of MANET relay on routing established. In recent years an excessive research done and many routing protocol proactive, reactive and hybrid are proposed. These protocols are used to satisfy various properties like efficient utilization, freedom from loops, battery capacity, route optimization, energy optimization and many of them.

Today's generation are totally depends on wireless networks and it is used in many Environments.

Which are as follows:

Commercial areas

- Disaster recovery
- Search and rescue
- Taxi cab network
- Vehicles communication
- Monitoring
- Military areas
- Battlefield
- Special operation
- Defense

II. LITERATURE SURVEY

Lot of work is already done, in the area energy efficient in manet different researchers in the form of localization algorithms. Some of the work defined by earlier researchers is defined here under

Author[5] proposed the adaptive service selection protocol that is based on the distance between the service requestor and the remaining service of the service provider. Author[6] proposed another mechanism to conserve the energy while increasing the channel utilization they tries to adapt the power level used by the mobile host that transmit the data packets to the target node. Author[7] of their very first paper proposed the power saver protocol it proposed the two algorithm BECA(basic energy conserving algorithm) and the afeca(adaptive fidelity energy conserving algorithm that allows node to be on sleep mode for a longer period of time. Authors[8] they proposed the protocol that optimized the minimum power and developed the algorithm that automatically find the path whose length is short. Used only for the local information.

III. CHALLENGES IN MANETs

At the time of routing network suffer many challenges such as no centralized infrastructure and frequent topology changing are the biggest challenges. Due to wireless connectivity the position of nodes changes continuously so we can not say that any particular protocol will give best performance.in every cases topology changes very frequently. Another challenge is bandwidth that is very limited in the network. Power supply of an network is also limited so whenever we want to extend the network lifetime the node run out of the energy and the performance decreases this is the major concern the MANETs facing it and also many energy enhanced protocol are also discovered so that the performance will remain stable in every case.

Challenges that are currently research are:

- Energy Saving
- Battery supply
- Packet Delay
- Packet losses
- Power supply
- Route discovery

SCALABILITY

Required to design the protocol which is scalable between no of nodes and their mobility in their network.

TRAFFIC

Efficient control is required on traffic that spread the network between source to destination of the nodes. The traffic is controlled by the source nodes in the routing protocol.

IV. MANET ROUTING

MANET routing is filled with number of issues that are not addressed in defined routing protocol:

- **Routes are outdated:** In routing outdated and insufficient routes to unreachable destination causes congestion, collision and many amount of power is wasted.
- **Topology changes frequently** and nodes leaving the network and becoming inactive.
- **Limited power at nodes:** In routing many nodes are not processing but they are consuming the power in small amount but it decreases the network lifetime and performance also.
- **Error Acknowledgement:** there must be a error reporting against error, delays, unreachable, packets loss, packet drop.
- **Unidirectional nodes**

The routing of MANET is done generally on the routing protocol for every particular case there is different protocol that is used to evaluate the performance of the network.

There are many routing protocol that evaluates the networks. There protocols are categorized in

- Proactive protocol
- Reactive protocol
- Hybrid protocol

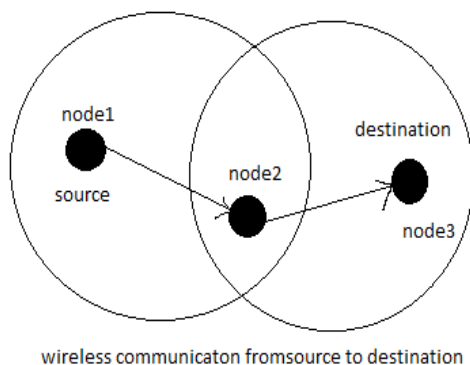


Fig1.

PROACTIVE PROTOCOL:

Proactive protocol are defined as if there is any need of a route to the destination that is available immediately. The cost of maintaining the network is very high because of frequent topology changing. In proactive protocol the routes are evaluated continuously within the network so when the packet is forwarded to the destination the route will be already known. From this the route is discovered and there will be no delay in sending the packets. These protocol are not suitable every time so there is several modification is done in the protocol to make it efficient. Examples of proactive protocol are WRP(Wireless Routing protocol)DSDV((Destination-Sequenced Distance-Vector), TBRPF(Topology Dissemination based on Reverse-Path Forwarding routing protocol) and OLSR(Optimized Link State Routing).Comparison of the protocol and their property are:

Protocol property	DSDV	OLSR	WRP
Route update	Periodic	Periodic	Periodic
Loop free	Yes	Yes	Yes
Routing overhead	High	Low	High
Throughput	Low	Medium	Low

Reactive Routing Protocols

This protocol is more efficient than proactive protocol. It also called on demand routing protocol as they do not maintain all the routes as proactive do. Reactive protocol finds the route between the source to destination whenever the communication is done. This type of routing is called on demand routing as it discovers the route that reduces the cost as compared to proactive and will be more efficient and widely used to enhanced the communication.in this also topology varies so several modification is implemented to upgrade the performance of the network.

Examples of reactive protocol are AODV(Ad-hoc On Demand Distance Vector),DSR(Distance Source Routing),TORA(Temporary Ordered Routing).Comparison of protocol and their property are:

Protocol property	AODV	DSR	TORA
Route creation	By source	By source	Locally
Periodic update	No	No	No
Performance	Speed	Shortness	Shortness
Multipath	No	Yes	Yes
Route updation	Non-periodic	Non-periodic	Hihgh routing overhed
Routing overhead	High	High	High

HYBRID PROTOCOL

It is the combination of both proactive and reactive protocol and it contains both advantage and disadvantage of both protocols to make hybrid routing. Example ZRP(Zone routing Protocol).

IV Definition Energy Efficiency

In wireless networks, the communication is done by the battery and to reduce the power consumption and that states the balanced performance after reducing the power is energy efficiency. The energy that is consumed by performing various task. Power constraint is not only that states the energy efficiency there are several constraint that states the efficiency like duration of time over which the maximum network can perform the better performance to enhanced the lifetime of the network.

Sometimes minimum number of energy route attract but if the network somewhere breaks then whole networks fails to performs the task because of node failure.

V. CONCLUSION

In this paper, the exploration to mobile ad-hoc network routing protocol is done. Various routing protocol are defined. The paper has discussed, various challenges and issues in MANET.

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