

Real Time Traffic Reduced Implying LBA in Mobile Ad Hoc Network

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Abstract— link failure and node failure is the major issue of the MANET which is responsible for the packet loss in the network and the packets are not reached to the destination. Bypass route mainly select for the transmission of data if the congestion occur in the path. There are various methods for finding bypass route to avoid congestion but this process is very time consuming as multiple paths should be constructed for sending the data from source to destination. In this paper, we initially detect the congestion in the path by calculating the capacity of the link and if the congestion detected then we applied Leaky Bucket Algorithm for the storing of data. This prevents the data from the dropping and retransmission of packets and improves the performance of network.

Keywords—MANET, Routing Protocol, Congestion control, AODV, Performance Metrics, Leaky Bucket Algorithm.

1. Introduction

Ad-hoc Network is present as the gathering of two or extra wirelessly devices which have the capability of communicating with every other without the any centralized resource administrator. These networks are normally mentioned to as MANETs (Mobility Ad-hoc Networks). MANETs contains of gathering of nodes that are free to move within the n/w and all nodes perform not only like a terminal but also as a router which has the functionality to forward the data. Mobile nodes can communicate directly thru wirelessly link if they are within different radio range and if not, they rely on other neighboring nodes which act as routers to relay [1]. In MANET all node (Mobility Device) acts as a router, that aid in forwarding packets from a sender to endpoint. MANET nodes can be devices e.g. mobility phones, laptop etc. MANET is suited for utilize in circumstances where a substructure is deploy or unavailable one isn't cost effective.

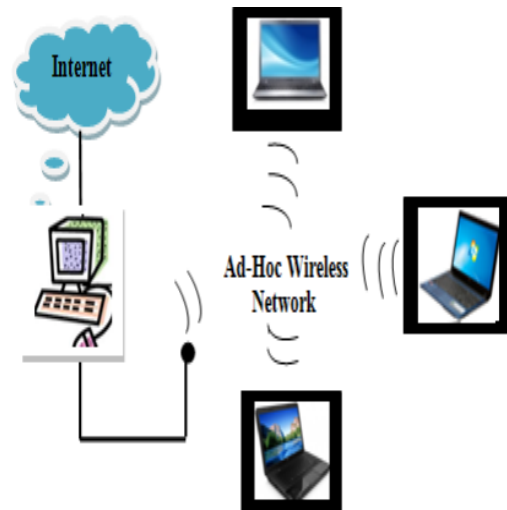


Fig.1 MANET

The designing of a trustworthy and efficient routing method is a very challenging issue in MANETs due to their mobility nature and limited amount of resources. In sequence to utilize these limited resources efficiently, an intelligent routing approach is necessary that should also be adaptable to the changing circumstances of the network, like, the network size, traffic density and network partitioning. MANET demonstrates unexpected behavior with several data streams under heavy traffic load e.g. multimedia data when it's transfer to general target node. The chief cause for protocol overhead, delay, and packet loss to detect newest route in MANET is because of congestion. So, in sequence to deal with each these problem, the routing in MANETs necessities to be congestion adaptive because of these issue service quality is affected.

2. Routing Protocol

Routing is a major problem of networking for sending information from sole node to the different node. WANET are also called MANET multi-hop n/w without prearranged topology. This is due MANETs can be classified as having a multi-hop, dynamic, potentially fast altering topology. The aim of such networks is to give communiqué capabilities to areas with limited or no existing communication infrastructures. A MANETs is usually formed thru mobility nodes utilizing wirelessly communiqué. It exploiting a peer-

to-peer multi-hop routing instead of a static n/w substructure to provide network connectivity. Routing protocols for MANETs can be normally classified into three core classes:-

- Proactive routing protocols:- Each node has one or greater routes to any viable target node in its routing desk at any given time in the network.
- Reactive routing protocols:- Every node achieves a route to a destination on demand fashion in the network. Reactive protocols don't maintain updated routes to any goal node within the n/w and don't normally exchange any periodic control messages.
- Hybrid routing protocols:-All node perform reactively inside the region near its proximity and proactively outdoor of that place, or nearby. Various routing protocols had been recommended and utilized for MANETs [2].

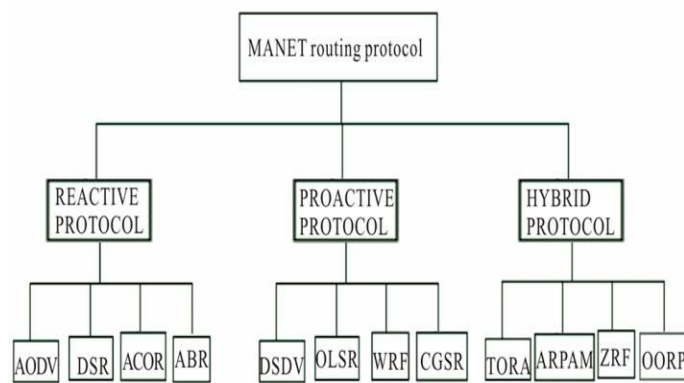


Fig. 2 Routing Protocol

3. Congestion Control In Manets

As mentioned in preceding component, congestion happens in MANET because of the presence of partial sources and for its restoration, quite a few strength and time is wasted. Congestion manage method is the approach via which the n/w bandwidth is distributed across several ends to end connections. Congestion control can be rate based or buffer based. Rate depend congestion control structure is usually applied in routing. The foremost idea for applying any congestion control approach is to increase the throughput, PDR and node transfer in the n/w and to minimize end-to-end delay, traffic congestion in the n/w [3].

4. Types of congestion

Congestion can be dividing into four kinds such as:

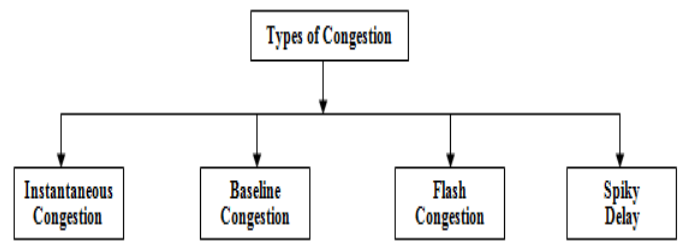


Fig. 3 Types of Congestion

Instantaneous Congestion

It's caused thru mild bursts, makes naturally thru IP traffic business.

Baseline Congestion

It seems to be caused thru systematic under-engineering of n/w or hop capacity (or alternatively because of simple sender overflow defined previous).

Flash Congestion

It recommends frequent but momentary times of overload in a extremely exploited n/w, where bursts from separate sender insert up to make important packet loss hills.

Spiky Delay

It a situation where no packets are transmitted for a longest time duration the transfer delay of packets shoots up from some milliseconds to tens of seconds during this time [4].

5. Literature Survey

Ila Singh et al. [2016] in this paper, the execution resolution is realized on DSR and AODV protocols with affecting aid from NS2 slicker. Three common amplification that PDR, throughput and drop packet are recycled for the analogy of the accomplishment of above protocol [5].

V. Sessa Bhargavi et al. [2016] this paper focuses on a newest hybrid secure routing protocol S-DSR that founds a secure communiq  path across the nodes in the n/w that can better the PDR and throughput etc. This protocol aid in detect the best path for secure file transmission based on the trust info from the nearby nodes. The define protocol has been executed on NS-2 .This protocol achieves better PDR and reduced delay when compared with protocols like AODV, AOMDV etc [6].

Mohamed Errouidi et al. [2016] in this paper, they will define about the aspect of consumption of energy in MANET's routing protocols. A performance evaluation of four routing protocols DSR, AODV, DSDV and Optimized Link State Routing (OLSR) with respect to average energy consumption

are explained thoroughly. Then, an evaluation of how the varying parameters of network in diverse situations affect the power consumption in these four protocols is discussed. A detailed simulation replica utilizing NS2 with dissimilar mobility and traffic replica is utilized to analysis their energy consumption [7].

Lincy Elizebeth Jim et al. [2016] in this paper, our present a Packet Storage Time (PST) routing attack where an attacking node modifies its storage time and thereby does not forward packets to the intended receiver nodes. In the Immune System of Human, cells are able to discriminate amid a range of issues including foreign body attacks as well as cellular senescence. This paper define an approach utilizing an Artificial Immune System that mimics the strategy of the Immune System of Human to identify the sender of a PST routing attack [8].

Shaik Mazhar Hussain et al. [2016] in our paper, our have proposed an approach that can ensure minimum delay though the routing parameters may differ. This kind of approach has found to be more efficient for the multimedia transmission over heterogeneous networks [9].

EO Ochola et al. [2016] This paper define a framework which overcomes the watchdog schemes weakness in the presence of power-aware routing protocols to accurately detect and eliminate black-hole nodes, thereby improving the network performance [10].

S.Kaarthiga, et al. [2016] in this paper, they analysis our system on the experiment NS2 simulation with social network situations. The test significant lower transmission cost and improves file sharing success rate compared to current methods [11].

Prachi D. Gawande et al. [2016] in this paper, In MANET many routing protocols are utilized, AODV routing protocol is one of them and the AODV has the dissimilar features, AODV is the reactive routing protocol and difficulties of DSDV routing protocol is overcome thru AODV. The link failure will degrade its features as when the error message is transmit back to sender and the procedure get repeated. In this paper, they are defining an approach when node links fails to obtain the data packets. Cryptography approach RC6 is utilized secure the network [12].

6. Proposed Work

In MANET, congestion occurs due to the node or link failure due to the high speed of packets transmission. When the packet is arriving more than the link or node capacity then they starts dropping the packets which is responsible for decreasing the network performance.

In the existing technique, they reduced congestion by distributing the data into multiple paths. When the possibility is identified of link failure then it buffered all the

packets to its previous node. But if buffer overflow then it will also create congestion.

To eliminate this buffer overflow problem, we introduce leaky bucket algorithm (LBA). When we identify the possibility of link failure then we apply LBA at node so that it reduces the traffic to fixed amount by sender and the link will not fail as the traffic will reduce. By which the congestion will reduce and it also reduces the use of traffic splitting function.

LEAKY BUCKET:

The leaky bucket is used to implement traffic policing and traffic shaping in ethernet and cellular data networks. The algorithm works similarly to the way an actual leaky bucket holds water. The leaky bucket takes data and collects it up to a maximum capacity. Data in the bucket is only released from the bucket at a set rate and size of packet. When bucket runs out of data, the leaking stops. If incoming data would overflow the bucket, then the packet is considered to be non-conformant and is not added to the bucket. Data is added to the bucket as space becomes available for conforming packets.

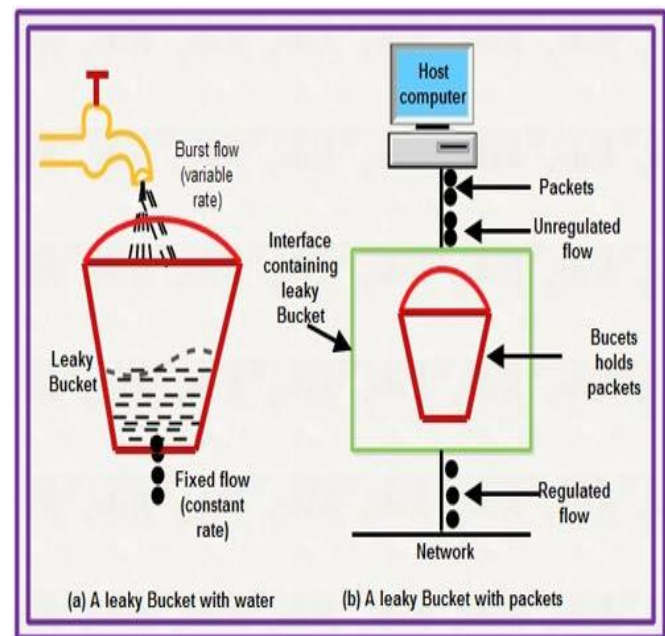


Fig.4 Leaky Bucket Algorithm

Proposed algorithm:

- Step:1 Select sender S and receiver R
- Step:2 Send the data from a path
- Step:3 Calculate the link lifetime LL
- Calculate these parameters signal strength, Route expiration time, Node's remaining energy and Node velocity.
- Step:4 Now add all the parameters
- Step:5 If $LL \leq \text{threshold}$

Then send acknowledge to sender and apply leaky bucket algorithm ()

Else

Send the data from the same path and continue

Step:6 Exit

For leaky bucket algorithm ()

Step:1 Set bucket size

Step:2 If size of packets \geq size of bucket

Increase bucket size and send data

Else

Send data

Step:3 Exit

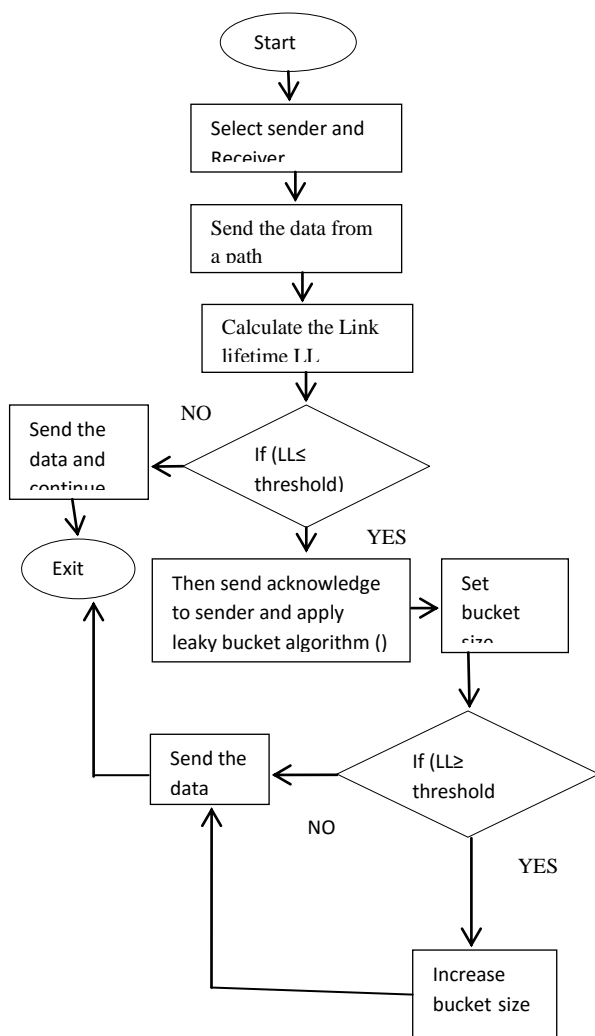


Fig.5. Flowchart of proposed work with leaky bucket

7. Result Analysis



Fig.6. PDR Graph

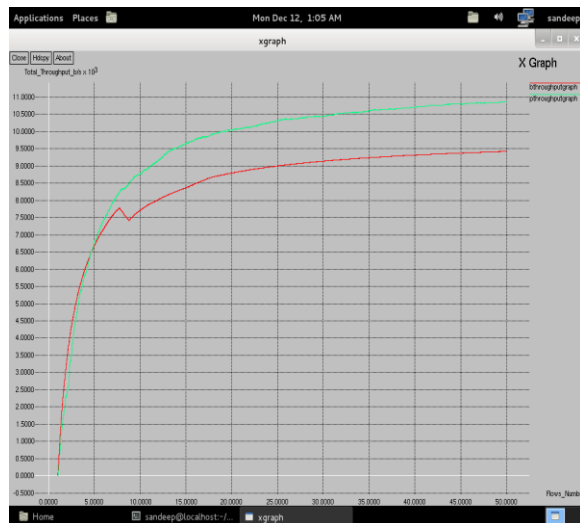


Fig.7. Throughput



Fig.8. Routing Overhead

8. Conclusion

A MANETs is usually formed through the mobility of nodes by utilizing wirelessly communication. In this paper, we improved the congestion control of the path or the link after detecting the node failure. Leaky Bucket Algorithm generally stores the data temporarily for traffic shaping. It controls the transmission rate of the data and protects it from the dropping into the network. This will reduce the traffic and perform the transmission of data from source to destination from the same path. We improved the network performance by reducing the overhead and increase the throughput and packet delivery ratio of the network.

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