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Distributed Hash Table based Routing for P2P Data sharing in MANETs

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Abstract

Peer to peer network is a distributed, robust and fault tolerant network for sharing resources such as files, CPU, memory etc. in P2P networks, peers organize themselves in a decentralized way. Thus, a link between two logically linked peers in the overlay network may spans multi hops in the physical network. In P2P network, a peer acts as both a server that provides or shares its content with other user/peer; and a client, that accesses the content from other users/peers. To access a content/data item, the requesting peer invokes the lookup phase to locate the source peer that provides the required data item.

In current research three parameters are used these parameters are like end to end delay, success rate, throughput. These performance parameters will helps in identify the performance of the flood free routing protocol compared to the flood based routing protocol. There is less end to end delay for current flood free protocol compared to the previous flood based routing protocol. Also has better success rate and better throughput. There is a improvement of around improvement of 30% in case of throughput and success rate. End to end delay also has shown the improvement of around 22%.

For AODV and OLSR. To design a secure routing protocol, it can have different aspects, like a security mechanism (e.g., encryption/decryption algorithms, digital signature, etc.), security services (e.g. authentication, confidentiality) and attacks (the act that can evade a security service).

Keywords: DHT,P2P,OLSR,AODV

Introduction**Introduction to MANET**

The wireless technology has started dated 1970. From that time there is large amount of development. Large amount of people also has started using this type of technology. Now a day's large amount of applications are there which are using this type of technology for large variety of people. Mobile technology is one of the best technology based on either CDMA or GSM.



Fig. 1.1: A Simple Wireless network [3]

In current time vast number of people has researched in this wireless field. They are making this technology most cost effective and more reliable and secured. MANET is mobile Ad-hoc network. Where without the fixed infrastructure wide variety of people are sharing their data. Each node can works source, destination as well as relay node.

Introduction to P2P

Peer to Peer network is the most effective network to share the resources in distributed manner. These resources can be memory, CPU etc. In Peer to Peer network people each node is self-organizing. Each node link with other node through multiple hops. An example of P2P overlay is shown in Fig. 1.

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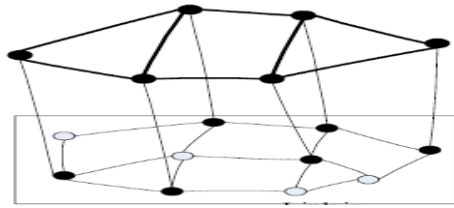


Fig. 1.2: Peer to Peer [1]

In P2P network each node while giving the resources, works as server. Provide services to the client. Other peer who is getting the services works as client. For getting the resources each node sends the request to the neighbor node. On receiving the route request the destination node reply. So that requesting peer accesses the resources directly or through the intermediate nodes. This step is called bootstrapping [1]. After finding the existing peer in the P2P network, the node places itself in the P2P overlay by establishing connection with other peers according to the overlay routing algorithm. On the basis of overlay structure, P2P networks can be roughly classified into *unstructured* and *structured* architecture. Each of them has its own applications and advantages.

In an unstructured P2P network, a peer establishes and maintains connection with a certain number of other peers chosen randomly, thus a random topology is established among the peers. Each peer in the unstructured P2P network holds its shared data items with itself; therefore, each peer uses flooding mechanism for data discovery in the P2P network.

Literature Survey

1. Nadir Shah (2016) et al. [1]: This paper has put up the study for Peer to Peer network. In this network various peer share the data amongst each other at application layer level.
2. G. Usha(2016) et al. [2]: MANET is the mobile ad-hic network. Where large amount of wireless nodes intercommunicates to each. in this research paper they have put the study to identify the black hole node using Honeygot techniques.
3. Theofilos Chrysikos (2016) et al. [3]: This paper has given the technique based on WITS. that means wireless Information-Theoretic Security. This type of technique is robust scheme for achieving the security in the network.
4. Sajal Sarkar(2016) et al. [4]: This paper has provides the technique based on game theoretic framework for stochastic multipath routing in MANET.

Algorithm

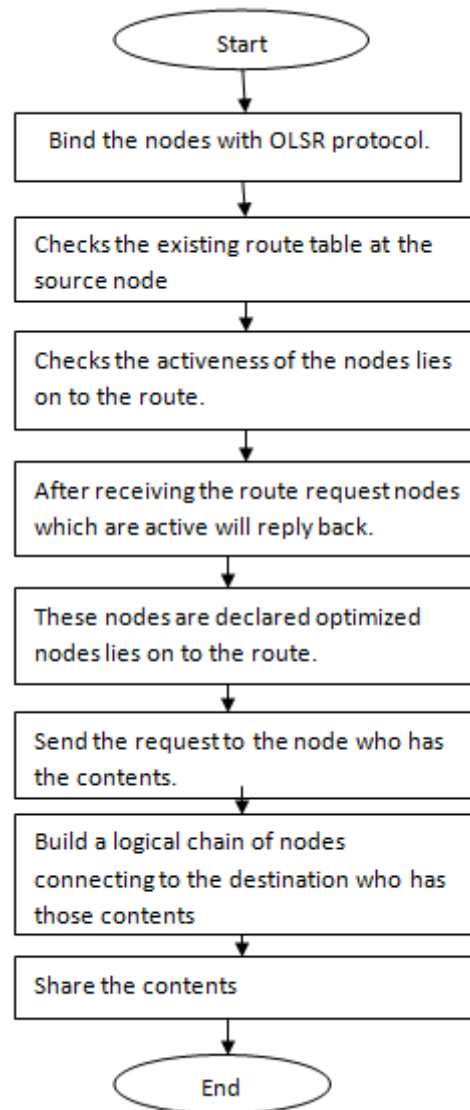
While communicating in peer to peer way for contents sharing under flood free routing protocol various steps are followed.

1. Take the network of various nodes moving in specific area. Bind the network under flood free routing protocol which is OLSR.
2. Before identifying the new route existing table carrying previous routes will be checked.
3. For checking the nodes activeness on to the route send the route request to selected nodes.
4. After receiving the route request who ever lies in the neighbor list will reply back.
5. Those active nodes are declared the optimized nodes

lies on to the route.

6. Check the peer who has the related contents required by the source.
7. Send the contents request to those nodes who has the related information.
8. Build a chain of peers from source to the destination for sharing of contents.

Flow Chart



Network Configuration

Network Size	1000*500
Number Of nodes	50
Protocol	OLSR
Application	CBR
Layer Of Communication	Link Layer
Binding protocol	TCP

Table 1.1: Network Configuration

These network configurations are used for configuring the network. So that a network is established using NS2 as network simulator. It is presetting for any NS2 based network configuration.

Performance Parameters

There are various performance parameters are being used while analysis of the performance of the network. It is also used for comparing the performance of current research with the previous research. These parameters are

- i. End to end delay.
- ii. Success rate.
- iii. Throughput.

End to End Delay: it is the total time taken for the packet to be sent from source to the destination. Delay=receive time-sent time

Success rate: that is how much packet has been sent success fully out the total no. of packet sent. Success rate=packets received/total packets sent.

Throughput: it is the packet sent per unit interval of time. Throughput=(packet sent-packet received)/total time

Results

End to End Delay

Xg file for both base technique and new proposed technique has been created and through tcl file xg graph with the help of xgraph command will be intilized.

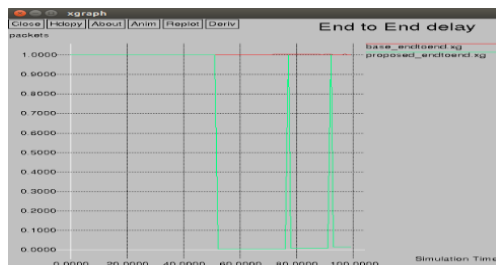


Fig. 1.3: graph for End to End delay

In this figure red is representing the base paper and green is representing the current research. In case of current research the end to end delay is tremendously less compare to the base paper.

Success Rate

Xg file for both base and proposed techniques success rate is created. This xg file contains the sequence of values.



Fig. 1.4: success rate

This graph shows the success rate for both base technique and the proposed technique. Red line shows the base technique and green line shows for the proposed technique. In case of base technique there is less success rate. Less amount of packets will be sent from source to the destination. Compare to the new technique which is flood

free technique. In case of proposed technique more success rate has been achieved.

Throughput

For throughput the xg file for both base and proposed technique has been created. Such there combines graph has been generated.



Fig. 1.4: graph for throughput

This graph shows the through put for both base technique and the proposed technique. Red line shows for base technique and the green line shows for the proposed technique. Proposed technique has better throughput compare to the base technique.

Conclusion

In flood free routing using OLSR is better efficient technique compare to the base flood based routing protocol. It identifies the optimized path from source to the destination. It identifies the peer from the already builded neighbor list. So those with less energy wastage more packets can be delivered from source to the destination. Various performance parameters are used for comparing the performance of the both the techniques. End to end delay has improved in case of proposed technique. It has improved around 45%. Success rate for the proposed flood free routing has also improved the result to 79%. More success has been achieved for flood free routing protocols. Throughput also has improved in case of proposed technique with 46%. So overall there is better performance for all the parameters.

Future Work

In future more optimization can be achieved by applying the same technique for another flood free routing protocol. Also results of the current flood free routing protocol performance can be checked.

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