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Multipath Routing with Optimal Load balancing and channel sensing in Mobile Ad hoc Networks

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Abstract-

Mobile Ad hoc networks have a collection of mobile nodes which are wireless and they do not have fixed base station and a proper infrastructure to exchange data. The nodes enter into a network dynamically and also leave it in the same way. So there is a frequent topological change and therefore needs a strong mechanism to find routes and maintain them. Quality of service is a main issue in mobile ad hoc networks. In this paper we analyze about multi path routing between source and destination, which will increase the performance, load balancing and the reliability. We present that multipath routing can be more efficient for data transfer if we find nodes that are not malicious, noisy and congested.

Introduction

Mobile Ad hoc networks have a collection of mobile nodes which are wireless and they do not have fixed base station and a proper infrastructure to exchange data. The nodes enter into a network dynamically and also leave it in the same way. So there is a frequent topological change and therefore needs a strong mechanism to find routes and maintain them.

Multi path routing establishes multiple paths between source and destination. In a unipath routing if the path fails it takes more time to search for a new route, and also the delay time for data transmission is longer. So multipath routing is suggested to improve the network service and a proper utilization of resources. A best route must be discovered to achieve QoS in MANET's.

Our motive in this paper is to analyze the routing techniques available for multipath routing and to suggest combined criteria's for route selection.

Related works

In proposed CA – AOMDV protocol was applied to attain secure routing in MANET. But it faces problems like tunneling attacks and selective drop of packets.

In proposed On – demand Multipath Distance Vector Routing in Ad hoc networks loop free paths are made certain. Many intermediate nodes provide new paths to the source. This works in a very fast and efficient manner and recovers easily from failures.

In proposed a novel automatic security mechanism using SVM to protect against malicious attack occurring in AODV. The method uses machine learning to categorize nodes as malicious. This system is flexible to the context changes general in MANET's, such as those due to malicious nodes changing their misbehavior patterns over time or

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quick changes in environmental factors,for instance the movement speed and communication range.

In Efficient Load sharing using Multipath Channel awareness Routing in MANET's malicious nodes are detected and removed. Loss of packet is reduced and security is improved. The channels that are available between nodes are monitored and noisy paths are removed.

AOMDV Protocol

In MANET's transfer of data from source to destination can take place through multiple paths. AOMDV (Ad hoc On demand Multipath Distance Vector) routing protocol finds multi paths to destination nodes. It maintains routing table for all the destinations in the network. It contains a hop count field to give length of the path for each destination with sequence number. The hop count is maintained for shortest and longest path and it remains unchanged. So loop freedom is provided.

Path Selection

When data packets are transmitted, among the nodes available to the destination, any node can be a malicious node. This will affect the performance of the network. These nodes attempt a fraudulent practice and access the messages of any sender. Therefore malicious nodes have to be detected and the path has to be rejected.

Noisy channels must be rejected to avoid communication problems over the channels. It is identified by calculating the signal strength during transmission. If it is higher than the noise then the channel is selected or it is rejected.

Data packets can be forwarded to the routes which have less congestion. It is calculated by, getting buffer size of the available links and number of packets occupied in each node. If packets exceed the buffer size the route is congested and alternated path can be chosen.

To improve the quality of service the delay time can be calculated with all the intermediate nodes using RREQ message along with timer from the source. When this message is received the nodes save the time and then forwardsto another. Using this the throughput time can be calculated in prior and then multi routes can be chosen.

Conclusion

In this paper we propose selection mechanisms for multipath routing. It includes, selecting the channels between nodes by sensing every path and avoiding noisy and congested paths. Also QoS improvement parameters are discussed, to achieve a better performance in multipath routing. This proposal will result in reduced congestion, delay and increased secure data transmission.

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