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MBRLM Method for Multipath Routing Congestion Control in MANET

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Abstract- In order to take on the commercial and non-commercial IT development groups of data stream in high-dimensional data cluster models, an infrastructure was built on the Manet platform that can be relied on. We are mostly interested in how to lower energy use and data loss in MANETs through congestion control and load balance in this project. So, this project offers a useful routing method called based Multipath backbone routing for load balancing in MANET (MBRLM) that spreads the load across multiple paths while lowering congestion. During the data transfer process, MBRLM adds a way to control bottlenecks and a way to spread out the load. An entry rate and an exit rate at a certain time interval T are used by the congestion control system to find the congestion. The load balance system picks a gateway node based on the link cost and the path cost to spread the load out as evenly as possible by choosing the best route. A node availability degree standard deviation measure is added to make the flow of distribution more efficient. What MBRLM did in terms of control overhead, the number of delivered packets, the average delay, and the number of dropped packets. As well, the results show that the hubs in the network are effectively spreading out the work.

INTRODUCTION

A. Mobile ad hoc network(MANET)

B. Ad hoc networks don't have any stable infrastructure and can organize themselves, be set up quickly, and change their configuration on the fly. A mobile ad hoc network (MANET) is made up of a spread-out group of movable wireless nodes that talk to each other over wireless lines. There is no central management or infrastructure. The nodes are flexible and can instantly and flexibly connect to each other when they need to. As well as being hosts, all of the mobile sites can also send data like a server.If two mobile noses are in the same radio broadcast area, they can talk to each other directly through wireless links. If they are not, they use routers to connect, which is known as multi-hop communication. MANET nodes can't talk to each other very much.

C. resources such as battery power, data, buffer room, and so on. In the military and other tactical settings, MANETs can be used for things like emergency rescue, communication on the battlefield, or exploration missions. In business settings, they can be used for things like conferences, course training, lectures, museum visits, multi-party gaming in the classroom or conference room, city tours,

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peer-to-peer apps, e-gaming, and more.

D. The fact that nodes could move around made it hard to figure out the network layout that nodes used to route at any given time. Also, because nodes can move around, the structure changes quickly and routes break off all the time. This hurts the upstream of a wireless network because it means a lot of packet loss and delays while looking for a new route. The nodes that run on low power batteries can only send data to nodes that are closer to them. But because the world is hard to predict, the wireless means isn't always reliable, and nodes can move around, many different kinds of problems can happen.

E. Load Balancing in MANET

Mobile nodes talk to each other over wireless channels that are limited in bandwidth, have varying capacity, are prone to errors, and are not safe. Additionally, wireless links have much lower capacity than wired links, making crowding more difficult. The mobile nodes' limited energy power and processing power also make it hard for each node to support different services and apps. When there is a lot of traffic, node resources like speed, processing power, battery life, and memory storage can run out. It's also possible for packets to be lost and buffers to overflow if a node is overloaded. This can make the end-to-end delay longer, slow down traffic, and even cause transport links to be lost.

In MANETs, the limited resources mean that data needs to be spread out evenly among the mobile users. Since hosts that are overloaded cause congestion and long wait times, or quickly run out of energy, which leads to network splits and application session failures. Because of this, load sharing is necessary to make better use of MANET resources and boost MANET speed. In a MANET, load balancing can cut down on both traffic jams and uneven loads, which can lower end-to-end packet delays and make mobile nodes last longer, among other things. Load mismatch is one of the most important problems in networks. To fix it, the load can be evenly distributed among the network's nodes, which also improves the speed of the network.

Multipath routing for load balancing

The unpredictable environment , the unreliable wireless medium, and the mobile nodes can leads to various faults in MANETs. These faults can be compensated by multipath routing which enable a single source to establish multiple routes to a single destination node in single route discovery which in turn provide route resilience, higher aggregate bandwidth, and smaller end-to-end delays and better load balancing. Load balancing can be achieved by MANET multi- path routing protocols .Multipath routing between any source – destination pair of nodes balance the load more evenlythroughout the network and

remove the latency in route discovery after a link break by utilizing the availability of multiple route path. It is believed that multipath routing balances the load significantly better than single path routing and multipath routing results in higher throughput. The number of paths and distance of node from center are the two parameters affecting the load while using multi path routing .

The route discovery in multipath routing has more overheads than in single path routing.

Proposed system

A. **Overview**

In the proposed system, the Multipath backbone Routing for load balancing in MANET technique for congestion control multipath routing in manet to efficiently balance the traffic load. Here, the selection of source node is done and it possesses good link status while minimizing the total path cost. Once, the load is detected by the candidate node, then immediately the packets are fragmented and load is distributed though the selected source node.

The selected node is in three useful paths and efficiently distributed the traffic load. Also, for efficient flow distribution a node availability degree standard deviation parameter is decreased the packet drop and increases the packet delivery ratio. In such a way the next implemented phase some error correction techniques such as network coding or forward error correction (FEC) can be implemented in the multipath routing in order to recover the packet losses due to transmission failure. The main advantages of proposed system are a connectivity factor to provide the node density adaptation. This approach can significantly decrease the number of retransmissions so as to reduce the routing overhead and also improve the routing performance.

The performance evaluation based on NS2 simulations shows that reduce the routing overhead for multimedia traffic due to the neighbor coverage knowledge and the probabilistic mechanism. It can also improve the performance of routing in mobile ad hoc networks.

B. Swarm Intelligence

Swarm intelligence (SI) is a type of artificial intelligence based on the collective behavior of decentralized, self-organized systems. The expression was introduced by Gerardo Beni and Jing Wang in 1989, in the context of cellular robotic systems. SI system are typically made up of population of simple agents or boids interaction locally with one another and with their environment. The agents follow very simple rules, and although there is no

centralized control structure dictating how individual agents should behsve, local and to a certain degree random, interactions between such agents.

C. Ant Colony Optimisation

The ant colony optimization algorithm (ACO), is a probabilistic technique for solving computational problems which can be reduced to finding good paths through graphs. This algorithm is a member of ant colony algorithms family, in swarm intelligence methods, the first algorithm was aiming to search for an optimal path in a graph; based on the behavior of ants seeking a path between their colony and a source of food. The original idea has since diversified to solve a wider class of Numerical problems, and as a result, several problems have emerged, drawing on various aspects of the behavior of ants.

F. Algorithm Steps

- Step-1: Distribute N nodes on XY-Plane randomly by using rand () function
- Step-2: Elect Cluster-Head initially
- Step-3: Find the distance of each node to CH
- Step-4: Form the cluster of each CH depending up on the distance
- Step-5: Assign initial energy to each node of cluster
- Step-6: Data transmission takes place cluster member of each cluster to respective CH
- Step-7: Elect CH maximum residual energy

Energy is most considerable parameter in cluster formation. We calculated the initial energy of the whole network and the energy of the network after processing the schedule, which reflects the energy consumed during communication.

G. Load Calculation

- Load = no of packets released / total number of packets
- Load is defined as exceed number of packets present in the node with respect to totalnumber of packets.

H. Optimal delay algorithm - end-to-end delay (AED)

The delay time is calculated using optimal delay broadcasting algorithm which means each node sends the neighbor discovery phase to neighbors, from the time taken by source node for broadcasting HELLO packets to its neighbor the delay is calculated and nodes are arranged in ascending order in terms of low delay node as first neighbor. This is defined as the average time taken by the data packets to reach the intended destinations. This include delay occurred due to different reasons like queuing delay, propagation delay, processing delay etc.

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Simulation Result

Network simulator 2 is used as the simulation tool in this project. NS was chosen as the simulator partly because of the range of features it provides and partly because it has an open source code that can be modified and extended. There are different versions of NS and the latest version is ns-2.1b9a while ns-2.1b10 is under development.

Fig 1 Routing performance analysis on PDR

Fig 2 Packet delivery ratio

Fig 3 Performance analysis of delay

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Fig 4 Performance analysis of energy

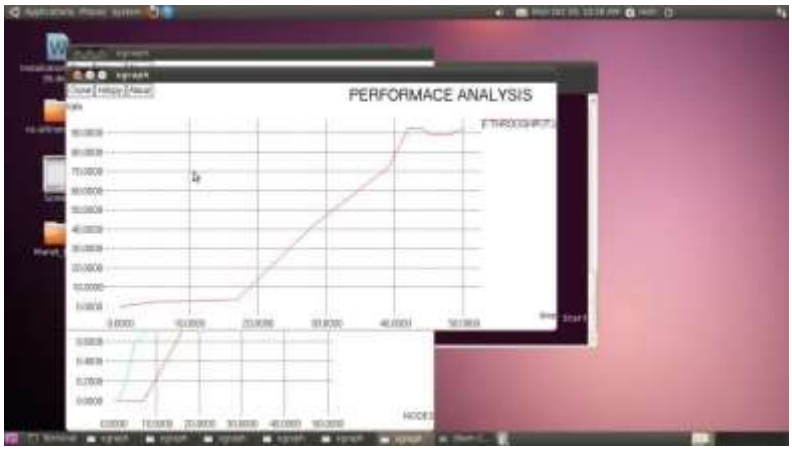

Fig 5 Performance analysis of Throughput

Conclusion

There are a number of attacks that can be made on existing adhoc routing protocols. These attacks can let target nodes change the routes that are chosen or start denial-of-service attacks. We specifically set up the blackhole attack, in which bad nodes grab packets and don't let them get to their target. You can use different attacks to see how well this suggested way works against those attacks. The procedure, which includes both AOMDV and ECC, is the answer.

REFERENCES

[1] Islam, M.T., Thulasiraman, P. and Thulasiram, R.K.: 'A Parallel Ant Colony Optimization Algorithm for All-Pair Routing in MANETs', Proceedings of International Parallel and Distributed Processing Symposium, 2003.

[2] Yin S. and Lin, X.: 'MALB: MANET Adaptive Load Balancing', IEEE 60th Vehicular Technology

Conference VTC 2004- Fall, 2004.

[3] Wang, G., Cao, J., Zhang, L., *et al*.: 'A Novel QoS Multicast Model in Mobile Ad Hoc Networks', Proceedings of the 19th IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2005.

[4] Mueller, S. and Ghosal, D.: 'Analysis of a Distributed Algorithm to Determine Multiple Routes with Path Diversity in Ad Hoc Networks', Third International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, 2005.

[5] Frias, V.C., Delgado, G.D. and Igartual, M.A.: 'Multipath Routing With Layered Coded Video To Provide QoS for Video-Streaming Over MANETs', 14th IEEE International Conference on Networks (ICON '06).

[6] Souihli, O., Frikha, M. and Hamouda, M.B.: 'Load-balancing in MANET shortest-path routing protocols', Ad Hoc Networks, 2009.

[7] Tekaya, M., Tabbane, N. and Tabbane, S.: 'Multipath Routing with Load Balancing and QoS in Ad hoc Network', IJCSNS International Journal of Computer Science and Network Security, August 2010.

[8] Toh, C.K., Le, A. and Cho, Y.: 'Load Balanced Routing Protocols for Ad Hoc Mobile Wireless Networks', IEEE Communications Magazine, 2009.

[9] Liu, C., Liu, K. and Li, L.: 'Research of QoS-aware Routing Protocol with Load Balancing for Mobile Ad hoc Networks', 4th International Conference on Wireless Communications, Networking and Mobile Computing (WiCOM).

[10] Ganjali, Y. and Keshavarzian, A.: 'Load Balancing in Ad Hoc Networks: Single-path Routing vs. Multi-path Routing', Twenty-third Annual Joint Conference of the IEEE Computer and Communications Societies INFOCOM.