Tile of the Project: A PROTOCOL FOR RELIABLE ROUTING IN MOBILE AD- HOC NETWORK'S (MANET)

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EXECUTIVE SUMMARY

In Mobile Ad hoc Networks (MANETs), the main reason for packet loss is due to the link failure or node failure. When the link failure occurs, the upstream node with the cached data in its buffer can retransmit it through the next reliable link by using a bypass route and fault tolerance technique is alone handled. The technique of choosing the bypass route and the way to avoid congestion in the bypass route are not handled. In this paper, an adaptive reliable and congestion control routing protocol has been proposed to resolve congestion and route errors using bypass route selection in MANETs. When a source node detects congestion on a link along the path, it distributes traffic over alternative paths. The congestion is detected according to the utilization and capacity of link and paths. The distribution of traffic considers the path availability threshold and utilizes a traffic splitting function. If a node cannot resolve the congestion, it signals its neighbors using the congestion indication bit. By using simulation, it has been shown that that the proposed protocol is reliable and achieves more throughputs with reduced packet drops.

In this research project, an enhanced technique has been prposed to resolve congestion using bypass route selection in MANETs. When a node detects congestion on a local outgoing link L, it calculates the multipath routes to destinations for which the path contains link L. Some portion of the traffic to node is then shifted to alternative paths. Congestion is detected on a local link if its utilization exceeds a local congestion threshold TH.

The objective is to minimize the utilization to a more acceptable level by shifting a portion of the traffic to the alternative paths and this part of traffic as bypass traffic. A node calculates a set of alternative paths and distributes the bypass traffic over these paths whenever it detects local link congestion or receives an Explicit Congestion Indication (ECI) bit from a neighbor. A node produces signals to its neighbors using the ECI bit. From the simulation results, it has been shown that the proposed protocol is reliable achieves more throughput with reduced packet drops.

Additionally, an adaptive reliable routing protocol using combined link stability estimation for mobile ad hoc networks has been developed. The main objective of this protocol is to determine a Quality of Service (QoS) path along with prolonging the network life time and to reduce the packet loss. A combined weight value for a path is computed based on the parameters Link Expiration Time, Node Remaining Energy and Node Velocity and received signal strength to predict the link stability or lifetime. When a link is likely to be broken, the previous node will cache the subsequent packets in its data buffer. When a link failure occurs, the upstream node with the cached data in its buffer can retransmit it through the next reliable link by using a bypass route. From the simulation results, it has been shown that the proposed reliable routing protocol achieves high delivery ratio with reduced delay and packet drop.

Publications:

International Conference:

1. R.Vadivel & Dr. V. Murali Bhaskaran, "An Energy Efficient with Secured Reliable Routing Protocol (EESRRP) for Mobile Ad hoc Networks", Proceedings in C3IT 2012 at **Academy of Technology (AOT)**, Aedconagar, Hooghly, West Bengal, India, February 25 – 26, 2012.

2. R.Vadivel [1], T. Shobana [2], "An Adaptive Replication Technique towards Energy Efficient Routing for Heterogeneous Mobile Ad hoc Networks", Proceedings of the First International Conference on Research Trends in Computer Technologies, pp. 314 – 318, 30th and 31st January 2013.

International Journal:

1. R.Vadivel & Dr.V.Murali Bhaskaran, "An Energy Efficient with Secured Reliable Routing Protocol (EESRRP) for Mobile Ad hoc Networks", Journal of **ELSEVIER** Procedia Technology, Vol.4, pp. 703 – 707. 2012.

2. R.Vadivel & Dr.V.Murali Bhaskaran, "Adaptive Reliable and Congestion Conscious Routing Protocol (RCCRP) using Link Stability Estimation with Bypass Route Mechanism for Mobile Ad-hoc Networks", **International Journal of Computer Applications-IJCA** (0975-8887), Vol.60, No.10, pp. 17-22, Dec.2012. Published by Foundation of Computer Science, New York, USA. [Journal Impact Factor â€" 0.814]

3. B Narasimhan, R Vadivel, "Secured Reliable Multipath Routing Protocol (SRMRP) using Trust Computation and Carrier Sense Multiple Access with Collision Intimation (CSMA/CI) for Heterogeneous IP-based Mobile Ad-hoc Networks", International Journal of Computer Applications, Vol. 60 No.10, pp:12-16, December 2012.

4. R Vadivel, and B Narasimhan, "Reliable Geographic Routing Protocol (RGRP) towards Improving Quality of Service (QoS) in Heterogeneous Mobile Ad Hoc Networks", International Journal of Computer Applications, Vol.60 No.15, pp:43-48, December 2012.

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6. R. Vadivel [1] and B. Narasimhan [2], "A Novel Energy Efficient Authentic Reliable Routing Protocol (EEARRP) for Scalable Mobile Ad hoc Networks", International Journal of Computer Applications, Vol. 56, No. 13, October 2012, pp. 22-25.

7. R.Vadivel [1], B.Narasimhan [2], "Power Aware Range-based MAC Protocol for Scalable Mobile Ad hoc Networks", International Journal of Computer Applications (IJCA), Vol. 49, No.11, pp.17-20, July 2012. [Journal IF 0.814]

8. B.Narasimhan [1], R.Vadivel [2], "Adaptive Position based Reliable Routing Protocol (APBRRP) for Mobile Ad Hoc Networks", International Journal of Computer Applications (IJCA), Vol. 52, No.14, pp.43-46, August 2012. [Journal IF 0.814].