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A Study of Multipath Routing Protocol for Mobile Ad Hoc Networks

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ABSTRACT

A group of MCB problems involving a wireless sensor network and multipath routing protocols is the subject of our presentation. For WSNs, the Multipath routing protocol, an active detection-based security and trust routing scheme, is proposed to overcome this obstacle. For blocking, node isolation, and network partitioning-type attacks, we demonstrate that multipath routing protocols outperform conventional protocols. In our attack model, an adversary is successful if they are able to capture or isolate a subset of nodes so that the gateway receives no more than a predetermined amount of traffic from the source node. In this work, the performance of multipath routing protocol to support application constraints such as reliability, load-balancing, energy-conservation and Quality-of-Service (QoS).

Keywords: *Multipath routing, reliability, load balancing, CMR, bandwidth, security, wireless sensor network, minimum cost blocking*

INTRODUCTION

Multipath steering is a directing procedure at the same time utilizing different elective ways through an organization. The term "concurrent multipath routing" (CMR) is frequently used to refer to the simultaneous management and utilization of multiple available paths for the transmission of data streams in order to enhance performance or fault tolerance. The benefits, such as fault tolerance, increased bandwidth, and improved security, may emanate from a single application or multiple applications.

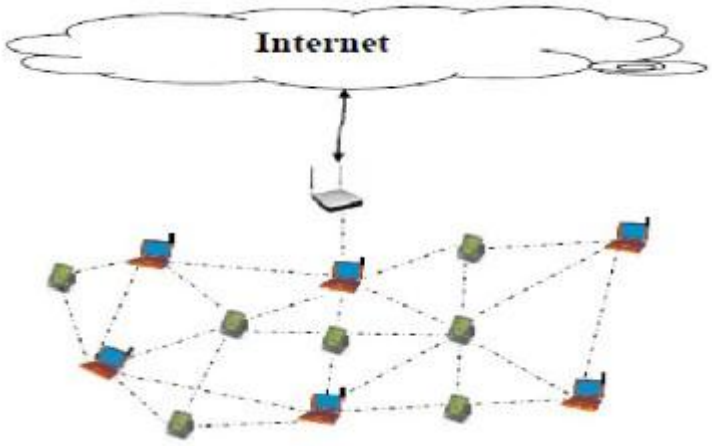
A stream is relegated a different way, as exceptionally conceivable given the quantity of ways accessible. Some streams will share paths if there are more streams than available paths. CMR gives better usage of data transfer capacity by making various transmission lines. In the event that a path fails, only the traffic assigned to that path is affected, offering some fault tolerance.

Additionally, there should ideally be an immediate alternative path available for continuing or restarting the interrupted stream.By providing simultaneous, parallel transport over multiple carriers with the capability to reassign an interrupted stream and by load balancing over assets that are available, CMR improves transmission performance and fault tolerance. However, under CMR, some applications may offer traffic to the transport layer more slowly, starving the paths that have been assigned to them and resulting in under-utilization. Additionally, switching to the alternate route will result in a re-establishing of the connection that could be disruptive.

This virtual path, which is demultiplexed at the network layer, receives applications' packets. Some algorithm, such as round-

robin or weighted fair queuing, is used to distribute the packets to the physical paths. The stream continues uninterruptedly to the application through the remaining paths in the event that a link fails, and any subsequent packets are not routed to that path. In comparison to the application-level CMR, this method offers significant advantages in terms of performance: The paths are used to their full potential when packets are continuously provided to all of them. All sessions remain connected regardless of the number of failed paths as long as at least one path is still available, streams do not need to be restarted, and there is no penalty for reconnecting.[1-8]

Multipath routing consists of finding multiple routes between a source and destination node. Accommodating the ad hoc networks' unpredictable and dynamic nature can be accomplished by employing these numerous routes between pair of source and destination nodes. Utilizing multiple pairs of routes between a source and a destination, multipath routing is a promising method for meeting these needs. Using multiple alternative routes through a network to achieve a variety of outcomes, such as increased bandwidth or enhanced security, is known as multipath routing. The computed multiple paths may overlap, be node-disjointed, or be edge-disjointed. Techniques for multipath routing have been the subject of a great deal of study.[9,10]



LITERATURE SURVEY[11-19]

Gyu Myoung Lee and Jin Seek Choi (2002) proposed solution like multipath routing using traffic splitting, Constraint based routing, path protection etc. that are used for traffic engineering, the network performance through traffic engineering and meet QoS requirements ,it minimizing the delay. However the above author's not consider, In QoS routing, an essential issues in routing granularity.

Madyen Mohammed salem and Salah Abdulghani Alababy (2021) most important routing protocols proposed for constrained networks ,such as WSN & WMSNs, to extend the lifetime and saving energy for WMSNs, However the above author's not consider, WSN & WMSN application require specialized hardware and have a complex set of requirement.

Sadia J.Siddiq, Faisal Naeem, Saud khan ,Komal S. Khan and Muhammad Tariq (2021) with the increased

complexity in wired/wireless networks, many end-to-end congestion control algorithm have been proposed and to design more plugin –based approaches that will boost the performance of current /future protocols for alleviating congestion , However the above author's not consider, Insufficient bandwidth-delay product in the network channel allocation.

Sundar aditya, Andreas F molisch and Hatim Behairy (2011) However Multipath propagation is a major obstacle that affects the accuracy of localization. However, multipath is a blessing because the spatial diversity it provides can be used to improve localization accuracy. However the above author's not consider, impacting localization accuracy is multipath propagation.

Junaid Qadir, Anwar Ali, Kok-Lim Alvin Yau, Arjuna Sathiaseelan and Jon Crowcroft (2015) proposed solution is to provide a comprehensive survey on network layer multipath solution, increased throughput ,reliability and fault tolerance . However the above author's not consider, the control panel problem of how to compute and select the routes, and the plane problem of how to split the flow on the computed paths.

Aboli Arun Anasane and Prof.Rachana Anil Satao (2016) the development is mainly due to the availability of small size sensor cameras and microphone to improve the channel utilization rate .However the above author's not consider, it has the transmission delay.

N. A Jabbar and G. Lencse (2022) especially in mobile phone networks and networks that support smart devices, it is an important question how to take advantage of network resources or distribute traffic between paths. However the above author's not consider is reduce blocking in the network in the terms of QOS and QOE using protocol is traditional protocol.

Moufida Maimour (2008) the proposed solution is to provide multimedia applications with the necessary bandwidth through non-interfering paths and increase the lifetime of the network; additional paths can be added as needed. However, the authors above did not consider that multipath routing is an appropriate solution for obtaining more bandwidth provided that multipath interferences are minimized.

Maciej Besta, Jens Domke, Marcel Schneider and Marek Konieczny (2021) proposed solution is to creating future high-performance multipathing routing protocols for supercomputers and data centers, supporting disjoint paths or enabling adaptively, and multipathing with both the shortest and non-shortest paths. However the above author's not consider, it is impossible to use established multipath routing schemes such as ECMP.

Anand Nayyar and Rajeshwar Singh (2018) by forwarding packets from sender to receiver, every sensor node actively participates in routing work. This packet forwarding is entirely based on network topologies. Highly considered for developing energy efficient routing protocols. However the above author's not consider, Energy efficiency & efficient routing mechanism which should be dynamic & efficient have issues to handle changing topologies.

PROBLEM IDENTIFICATION

Due to channel constraints and dynamic network topologies, blocking node isolation and network partitioning attacks are simple to launch and effective in the domain of wireless networks. The majority of the research presented here is theoretical and proves that multi-path routing protocols outperform malicious attacks.

Attacks are easy to launch in the wireless networks.

- Blocking (traffic-time delay)
- Node-isolation (intermediate node isolate-stop data)
- Network-partitioning (splitting of network)
- Fake link (wrong path)
- File modification (changes made in original file).

MODULUS DESCRIPTION

Node Initialization

In this method, the users from various positions requesting files from the node in wireless networks, Registered, Stored in Database Ready to login.

Topology Construction

The Routing construction the users may find the possible way to send the data. The MRP is a routing protocol used for dynamic wireless networks where nodes can enter and leave the network at will.MRP is capable of both unicast and multicast routing.

Finding the Malicious Node

After create the topology, users can send the data to the destination through selected path. Initially select the file and choose the destination node and find the available path then transmit the data to the destination node. Malicious node attack the routing path and block the data or attack the data. Finally the user find the attacker node using Multipath routing protocol.

Node Isolation

It may be the most intuitive way to prevent further attacks from being launched by malicious node in MANET. The neighbors of the malicious node do not forward or accept packets from the malicious node in order to carry out the node isolation response.

Get Efficient Routing Path

An appealing strategy for dealing with path failures is the multipath routing method, which makes use of both the primary path and the alternative path. However, the strategy still needs to address two issues in order to improve network performance.

CONCLUSION

The rapid evolution of information and communication technologies including the internet has bred positive implication to organization and social lives. Due to ever increasing complexities in cybercrimes, there is the need for cyber security methods to be more robust and intelligent. Hence organization is increasingly challenged by a wide range of cyber-attacks. In this project, the ability of the multipath routing protocol to support application constraints like energy conservation, load balancing, reliability, and Quality of Service (QoS) is examined in this work.

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