

Keeping the Routing Secure in Wireless Local Area Network

Rupinder Singh
Assistant Professor
Chandigarh Group of Colleges, Landran
rupinder.3573@cgc.edu.in

Abstract

The rapid need of wireless demands a great deal of security and reliable routing in order to keep all the data sources and equipments secure. In order to develop efficient and robust protocols, it is essential to understand the inherent characteristics of wireless networks such as connectivity, coverage and varying channel conditions. Wireless LAN introduces the concept that use can connect to any one at any place at anytime by using various mobile appliances that can be carried at any place. Now Communication is no longer limited to a one place by holding wired phones. This is the big boom to the I.T industry but it also brings a lot of opportunities and challenges for the Network Administrator who is looking after the Wireless LANs (WLAN). WLAN traffic travels over radio waves that cannot be constrained by the walls or any obstacle that comes in his line of direction. So because of this hackers can easily hack that material that is been transferred from different nodes. . In wireless LAN, Denial of Service or Jamming is caused by disrupting or denying the communication between sender and receiver. So for this reason the SNR is decreased at the receiver end. To understand how the signals are getting weak and how the jammer attacks the wireless LAN so that network performance drops down significantly. It is important to develop some powerful tools for network analysis, design and managing the performance optimization of the network. In this paper some of the most common attacks and threats are explained and the prevention that can be taken by using various tools is implemented. All the nodes and the attacks are been shown by using a simulator NS2.

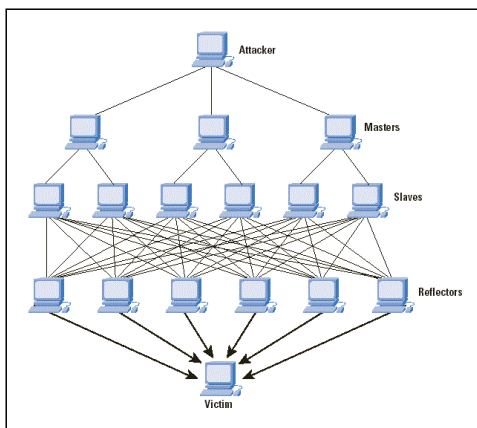
Keywords: Scheduling Algorithm, Routing, Wireless, Inter Domain Model

I. Introduction:

In the latest research on Wireless Networks, researchers are trying to find and overcome the limitations of wireless networks such as limited energy resources, ranging energy consumption by location, the high cost of transmission, and limited processing capabilities. All

these features of wireless are not present at all in cable networks, where energy consumption is not at all a problem, the cost of transmission of the data is very cheap and nodes have lot of processing power. We need to find the new ways for this new generation to work on the networks. So in order to succeed we have to enhance the routing criteria. Routing is the process used by the data communication networks to deliver packets from a source device to a destination device. In WSN, the three main routing categories are:

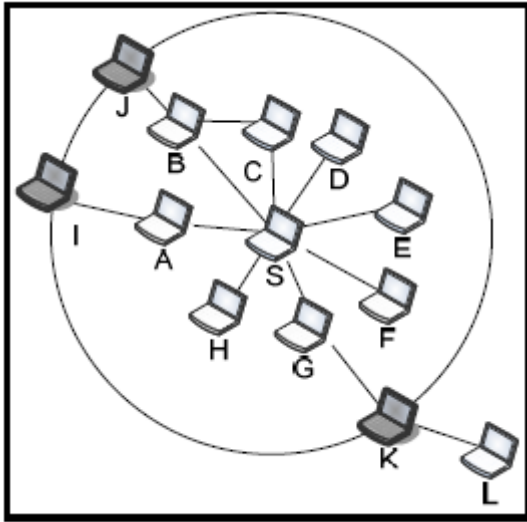
- Flat-based routing: In this, all nodes have an equal role and perform equal tasks.
- Location-based routing: In this, all nodes have their roles to route data according to their locations.
- Hierarchical routing based: In this, all nodes have their own different roles of others.



II. How to Route in Wireless Networks

To identify the most efficient route for passing information from source to destination Known as packet routing — is very important to create a reliable and secured network.

Attempting to optimize packet routing in these systems. There are many algorithms that can be used over the past decade. We are going to focus here on some specific algorithms that will help to construct routing decisions. Nevertheless, the performance of existing models are not as efficient as is shown in the proposed model.



Routing zone with radius $r=2$

We observe that opportunism outperforms cooperation and identify interference resulting from the larger number of transmissions under cooperative forwarding as a cause for mitigating the potential gains achievable with cooperative forwarding. Mobility in wireless networks introduces additional sources of channel variation and makes routing even more challenging. Frequent changes in network topology require additional control overhead for gathering link state information needed for determining routes.

III. RELATED WORK

According to routing includes origin packets in the direction that is referred as a destination by giving packet delivery relation. This thing guarantees the efficient delivery of packets from source to destination.

By implementing this work the failure issue of the nodes reduced considerably. This rule enhances the life of wireless detector by estimating the interval of nodes. The Proposed protocol selects a cluster head that have a highest energy. The cluster head sends the packets to the gateways. XU Jiu-qiang. projected the prominent rule for connecting nodes. This rule provides a way to attach the nodes of wireless network.

IV. EXPERIMENTAL DESIGN

The proposed model has been designed for the minimal use of energy and hence minimum energy consumption over the wireless networks along with high energy level path selection for the Reliable Routing and Scheduling in Wireless Networks. It starts with development of nodes to execute the essential simulation and then implementation of necessary code for Inter Domain algorithm for detecting the dead nodes. After implementing the energy based path selection for load balancing now implement the best among various paths using Game Theory.

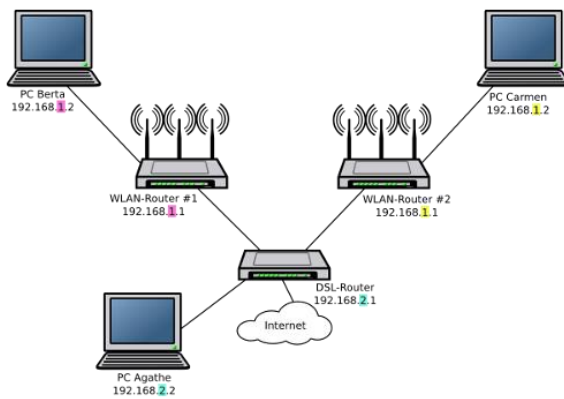


Figure1. Design Strategy

Having an accurate model for the Inter Domain process is important for this and identifying all of the intrusions that may occur can lead to more inaccurate and non-realistic decision making

After testing a model with a more detailed Inter Domain process we found that a lot of the routing process got easier and more secured. It has been enhanced for the dual layer, which checks the network performance evaluation and security level of the target nodes in order to protect nodes from intruders.

v). Result Analysis

The overall results of the simulation has been obtained from various network performance parameters, which are collected in terms of data in the terms of data propagation, queuing delay and other related parameters.

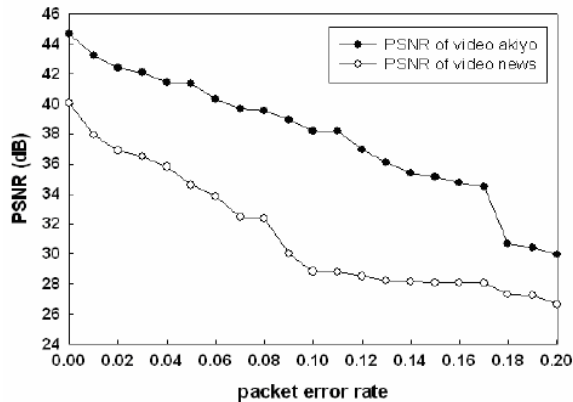


Fig 2. Performance evaluation based upon the packets

Figure 1 gives the performance result of transmission delay obtained from proposed model simulation. The delay tells the performance of the network. The proposed model has been tested with constant bit rate at the rate of 100 kbps over which are targeted from source to destination.

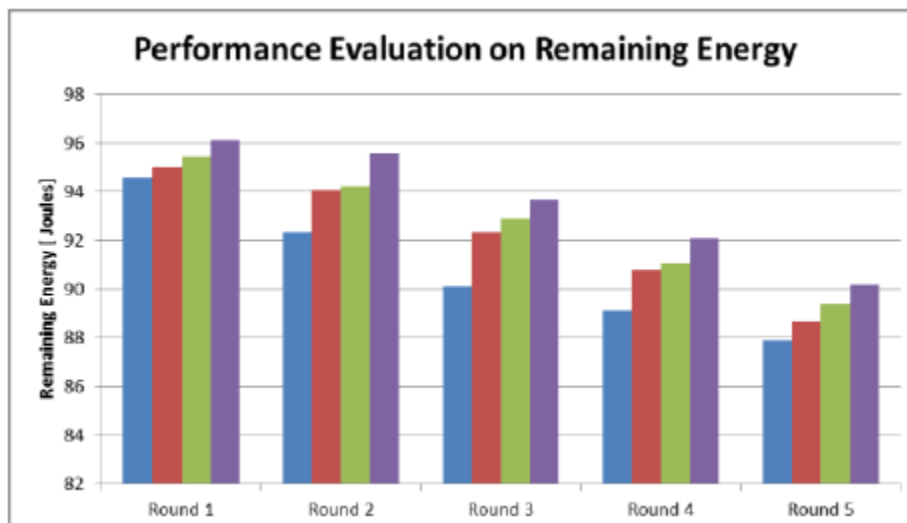


Fig 3. Performance evaluation based upon the energy consumption

Energy consumption in wireless network is evaluated for the overall performance of the proposed model in order to estimate the overall remaining energy on the nodes. All the nodes transmit the data packets in order to send these packets they lose some of the energy which has been tested. The energy less nodes and the more energetic nodes are the most susceptible nodes in the routing process. Those nodes have to be skipped from the routing for secured and efficient routing process.

i) Conclusion

The proposed model has been efficient and secure method for Wireless Networks which is achieved by implementing a Inter Domain algorithm which gives assurance that the security and proper routing can be achieved and packets will have to follow the shortest and the safest route to reach their destination. The proposed model has been tested under various conditions

New model has been found efficient in terms of secured path as the best routing paths has been achieved by other researchers as well but there always a big question mark on the security of the path chosen. New system will also provide reliability to network users for communication without any trouble or leakage.

ii) References

- [1] L. Barri re, P. Fraigniaud, L. Narayanan, and J. Opatrny, “Robust Position-Based Routing in Wireless Ad Hoc Networks with Unstable Transmission Ranges,” *J. Wireless Comm. and Mobile Computing*, vol. 2, no. 3, pp. 141-153, 2001.
- [2] M. Battelli and S. Basagni, “Localization for Wireless Sensor Networks: Protocols and Perspectives,” *Proc. IEEE Canadian Conf. Electrical and Computer Eng., (CCECE '07)*, pp. 1074-1077, Apr. 2007.
- [3] M. Zorzi, “A New Contention-Based MAC Protocol for Geographic Forwarding in Ad Hoc and Sensor Networks,” *Proc. IEEE Int’l Conf. Comm. (ICC '04)*, vol. 6, pp. 3481-3485, June 2004.
- [4] Malekzadeh M, Ghani AAA, Subramaniam S. “A new security model to prevent denial-of-service attacks and violation of availability in wireless networks”. *International Journal of Communication Systems* 2012.
- [5] [76] Wu D, Wang R, Zhen Y. “Link stability-aware reliable packet transmitting mechanism in mobile ad hoc network”. *International Journal of Communication Systems* 2012.
- [6] [77] Singh G, Kumar N, Verma AK. “Ant colony algorithms in MANET: A review”. *Journal of Network and Computer Applications* 2012; 35(6):1964 – 1972, doi:<http://dx.doi.org/10.1016/j.jnca.2012.07.018>. URL <http://www.sciencedirect.com/science/article/pii/S1084804512001701>.
- [7] [78] Zhang Z, Feng Z. “Two-stage updating pheromone for invariant ant colony optimization algorithm”. *Expert Systems with Applications* 2012; 39(1):706 – 712, doi:<http://dx.doi.org/10.1016/j.eswa.2011.07.062>. URL <http://www.sciencedirect.com/science/article/pii/S0957417411010244>.