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DESIGN AND ANALYSIS OF INCREASING THROUGHPUT AND MINIMISING CROSSLAYER OPERATIONS IN IEEE 802.11 WLAN

Dr. K. Balaji[1], S. Saravanan[2]

[1,2] *Assistant Professor, Department of Electrical and Electronics Engineering, St. peter's University, Avadi, Chennai, Tamilnadu, India*

Abstract - ***The back-pressure support wireless networks have two main processes namely scheduling and routing. These two processes are considered to be the backbone of all such networks. Generally these processes takes place jointly in the network layer, this leads to computational complexities, cross layer operations and the practical implementations are also difficult. Thus to overcome these problems two algorithms Diff-max and wDiff-max are used. The use of these algorithms reduces the cross layer operations in addition to it; it also increases the throughput of the network. Using the Diff-max algorithm, the scheduling and routing are separated and thus leads to modularity and the practical implementation is also made easy. This back pressure frame work is conceptually viewed as layered both routing and scheduling takes place in two different layers secure transmission is also ensured using AES algorithm. The above process is simulated in Network Simulator version 2. (NS 2)***

Key Words: *AES algorithm, Scheduling, Routing, Wireless networks*

1. INTRODUCTION

Wireless networking is a method by which homes, telecommunications networks and enterprise (business) installations avoid the costly process of introducing cables into a building, or as a connection between various equipment locations. [1-3]

1.1 Types of Wireless Networks

a)Wireless PAN

Wireless personal area networks (WPANs) interconnect devices within a relatively small area ,that is generally within a person's reach. For example, both Bluetooth radio and invisible infrared light provides a WPAN for interconnecting a headset to a laptop. ZigBee also supports WPAN applications. Wi-Fi PANs are becoming commonplace (2010) as equipment designers start to integrate Wi-Fi into a variety of consumer electronic devices. Intel "My Wi-Fi" and Windows 7 "virtual Wi-Fi" capabilities have made Wi-Fi PANs simpler and easier to set up and configure.

b)Wireless LAN

A wireless local area network (WLAN) links two or more devices over a short distance using a wireless distribution method, usually providing a connection through an access point for internet access. The use of spread-spectrum or OFDM technologies may allow users to move around within a local coverage area, and still remain connected to the network.

Products using the IEEE 802.11 WLAN standards are marketed under the Wi-Fi brand name. Fixed wireless technology implements point-to-point links between computers or networks at two distant locations, often using dedicated microwave or modulated laser light beams over line of sight paths. It is often used in cities to connect networks in two or more buildings without installing a wired link. [4-6]

c)Wireless Mesh Network

A wireless mesh network is a wireless network made up of radio nodes organized in a mesh topology. Each node forwards messages on behalf of the other nodes. Mesh networks can "self-heal", automatically re-routing around a node that has lost power.

d)Wireless MAN

Wireless metropolitan area networks are a type of wireless network that connects several wireless LANs.They are wireless networks that typically cover large areas, such as between neighboring towns and cities, or city and suburb. These networks can be used to connect branch offices of business or as a public internet access system. The wireless connections between access points are usually point to point microwave links using parabolic dishes on the 2.4 GHz band, rather than omnidirectional antennas used with smaller networks. A typical system contains base station gateways, access points and wireless bridging relays. Other configurations are mesh systems where each access point acts as a relay also. When combined with renewable energy systems such as photovoltaic solar panels or wind systems they can be stand alone systems.

e)Global Area Network
A global area network (GAN) is a network used for supporting mobile across an arbitrary number of wireless LANs, satellite coverage areas, etc. The key challenge in mobile communications is handing off user communications from one local coverage area to the next. In IEEE Project 802, this involves a succession of terrestrial wireless LANs.
f)Space Network
Space networks are networks used for communication between spacecraft, usually in the vicinity of the Earth. The example of this is NASA's Space Network.

2. PROPOSED SYSTEM

Diff-Max:
In our proposed system we are separating the routing and scheduling to takes place in two different layers ,that is routing takes place in Network layer and scheduling takes place in Link layer we are using Diff-max ,Diff- sub max and W Diff-sub max algorithm .By using our Diff-max approach we can overcome the disadvantage of the Existing system;
1) Diff-Max improves throughput significantly;
2) The separation of routing and scheduling makes practical implementation easier by minimizing cross-layer operations; i.e., routing is implemented in the network layer and scheduling is implemented in the link layer;
3) The separation of routing and scheduling leads to modularity; i.e., routing and scheduling are independent
Based on the structure of the NUM solution, we propose Diff-Max. We show that the deterministic version of Diff-Max optimizes utility, and we conjecture that its stochastic version satisfies stability and utility optimality [7-8]

3. RESULTS AND DISCUSSION

Node Creation

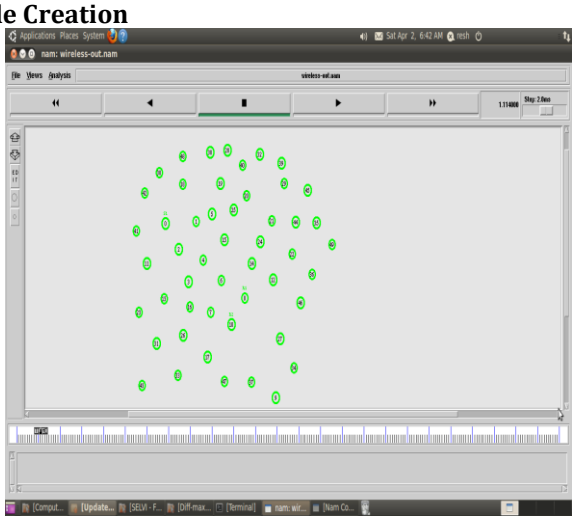

Fig -1: Creation of nodes

Fig 1 shows the Nodes are created for the transmission of datapackets. Source node and receiver nodes are assigned. From source the packets are to be transmitted to the destination ends

Assigning source and destination nodes

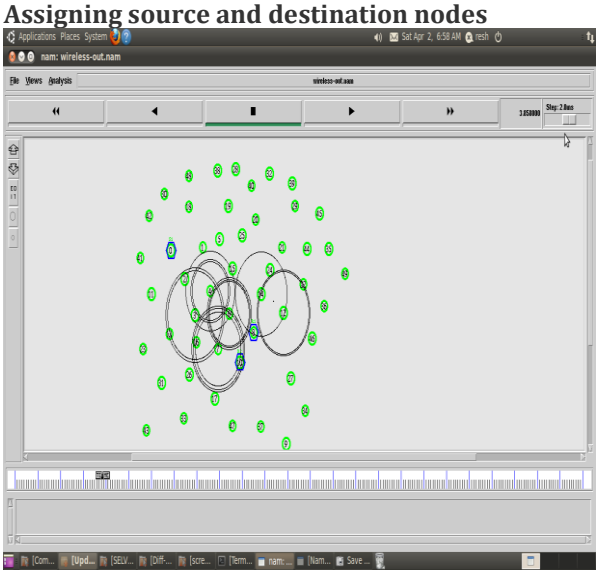

Fig -2: Source and Destination Node Assignment
Fig 2 shows the source (s1) and multiple destinations (r1and r2) are assigned. The packets that are transmitted from the source to the destinations that are assigned.

Assignment of Path

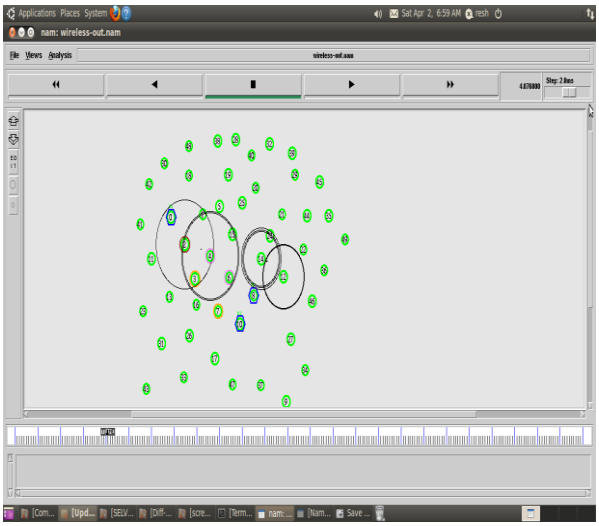

Fig -3: Assignment of Path
Fig 3 describes the path from source to destination is assigned. It is assigned using the diff max algorithm.

Transmission of Data packets

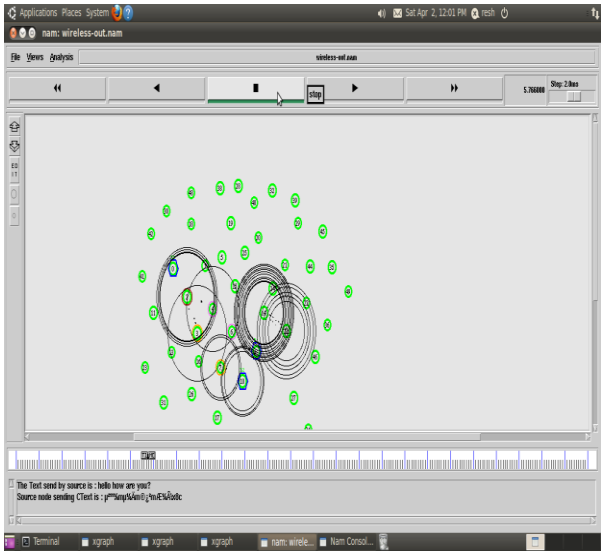

Fig -4: Transmission of Data packets

Fig 4 shows the data packets from source node in being transmitted to the nearby nodes .The routing and scheduling algorithm process are being initiated. The data packets are routed and the scheduled and reaches the destination end.

Throughput Vs Time

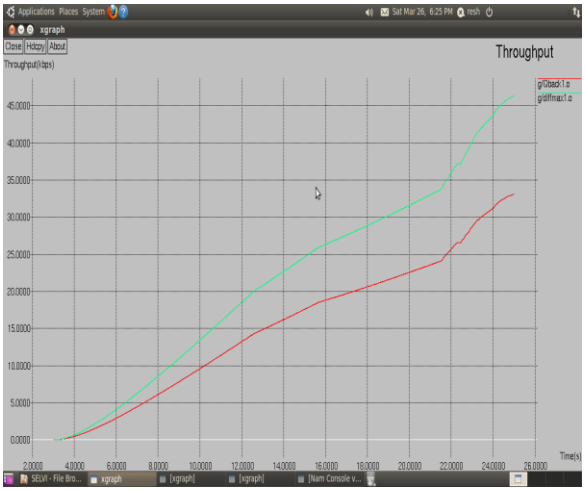

Fig -5: Throughput Vs Time

Fig 5 proposed the above graph is a plot between throughput and time. When time increases the throughput also increases. When Diff-max is compared with Q backpressure, it is inferred that the throughput of Diff-max is greater than the Q backpressure.

Packet Loss Vs Time

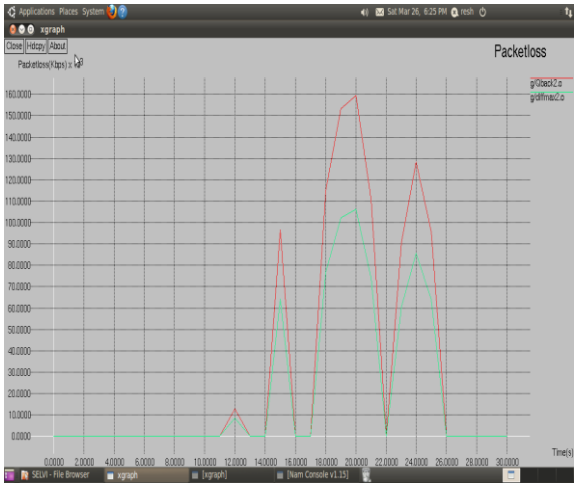

Fig -6: Packet loss Vs Time

Fig 6 shows the above graph is a plot between packet loss and time. When time increases the throughput also increases. When Diff-max is compared with Q backpressure , it is inferred that the packet loss of Diff-max is lower than the Q backpressure

4. CONCLUSIONS

In this paper, Diff-Max, a framework that separates routing and scheduling in backpressure-based wireless networks. The separation of routing and scheduling makes practical implementation easier by minimizing cross-layer operations and it leads to modularity. Our design is grounded in the network utility maximization (NUM) formulation of the problem and its solution. Based on the structure of Diff-Max, two practical schemes, Diff-subMax and wDiff-submax are developed. Security is also added to the transmitting and receiving nodes. In order to ensure better, safe and secure transmission, the transmitting messages are encoded with a secure key and in the receiving side it is decrypted with the same secure key. In future, few other parameters such as bit error rate, delay performance and jitter delay can be observed and tabulated. Simulations in ns-2 demonstrate significant improvement in terms of throughput, utility, and packet delay as compared to AODV and DSDV.

REFERENCES

[1].Nosratinia , T. E. Hunter and A. Hedayat, "Cooperative communication in wireless networks", *IEEE Commun. Mag.*, vol. 42, pp. 74-80, 2004.

[2]. Zhang , Q. Chen , F. Yang and X. Shen, "Cooperative and opportunistic transmission for IEEE 802.11-based ad hoc networks", *IEEE Netw.*, pp. 14-20, 2007.

[3].P. De , A. Raniwala , S. Sharma and T. Chiueh, "Design considerations for a multihop wireless network testbed" , *IEEE Commun. Mag.*, pp. 102-109, 2000

[4]X. Zhang; W. Cheng; H. Zhang"Heterogeneous statistical QoS provisioning over 5G mobile wireless networks" IEEE Network Year: 2014, Volume: 28, Issue: 6 Pages: 46 -53, DOI: 10.1109/MNET.2014.6963804.

[5]Z. Zheng; J. Wang "A Study of Network Throughput Gain in Optical-Wireless (FiWi) Networks Subject to Peer to Peer Communications", Communications, 2009. ICC '09. IEEE International Conference on Year: 2009 Pages: 1 - 6, DOI: 10.1109/ICC.2009.5198676

[6]O. Salami; H. A. Chan; A. Bagula"Multi-layer Resource Optimization and QoS Guarantee for Inter-workingWireless Networks"Year: 2008 Pages: 120 - 123, DOI: 10.1109/BROADCOM.2008.46

[7] Qixuan Zhu; X. Zhang"Statistical-QoS based gaming for optimal power allocations over virtualized wireless relay networks supporting multimedia services", Year: 2015 Pages: 151-156, DOI: 10.1109/MILCOM.2015.7357434

[8]K. Ramezani; E. Sithirasenan; V. Muthukkumarasamy "Formal Verification of the Coordinated Robust Authentication Protocol forWireless Networks"Trust, Security and Privacy in Computing and Communications (TrustCom), 2013 12th IEEE International Conference. Year: 2013 Pages: 1735 – 1740