



# Performance Trade of QoS in IEEE 802.11b using Various Security Parameters

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## Abstract:

IEEE802.11 have been fully understood in the networking era. Opnet with IEEE802.11 give assistance is an easily understood able simulation tool for communication researchers. However it's academic Edition have limited abilities. In this paper author have studied performance of IEEE802.11b (WLAN) using various security parameters. Author found that the throughput was decreases with respect increase in number of nodes and packet drop also increases with increase in number of nodes.

**Keywords:** WLAN, OPNET, Fixed nodes, AODV, IEEE 802.11b.

## I. INTRODUCTION

Wireless consist of rapid growing present era tells the flexibility of wireless access into public or domestic area .WLAN to ensure their commercial success into global operation, low power or license free operation. In the WLAN it is easy to robust transmission, simplified spontaneous corporation, easy to use and transparency for connections. The most commonly simulation tool is OPNET Riverbed modeler. This simulation tool is considered as a first class simulation tool .Which is very easy to make communications project work. OPNET modeler is not costly for students which are individually researchers. This is the reason to prefer OPNET modeler as a simulation tool. Author tells the ability and flexibility of OPNET simulate WLAN performance Trade of Qos in IEEE 802.11b using various security parameters.

## II. Why IEEE 802.11 WLAN

IEEE 802.11 standard is one of the prominent wireless local area network standards being adopted as a mature technology. The success of the IEEE 802.11 standard has resulted in the easy availability of commercial hardware and a proliferation of wireless network deployment, in wireless LANs as well as in mobile and ad-hoc networks. Although IEEE 802.11 is not designed for multihop ad hoc networks, the easy availability has made it most chosen MAC.[1]

## III. MAC LAYER IN 802.11B

The IEEE 802.11b MAC protocol operates in the 2.4 GHz band designed for ISM applications. It is designed to cover large areas, upto 100 meters in diameter and connect hundred of computers. The system is able to operate at four different data rates 2 , 5.5 ,11 ,24 mbps. The 802.11b MAC module implemented in SAM uses the following data rate adaption algorithm. The transmitter and receiver nodes exchanges the RTS and CTS frame at the minimum rate. [2]

## IV. PROBLEM SOLUTION

In research of IEEE 802.11b the author find the problem solution on AODV (Ad-hoc on-demand distance vector routing system). AODV is a routing protocol and it is compatible in WLAN systems.

### AODV: -

Ad-hoc on demand distance vector routing system is a reactive on request protocol. AODV is engineered for mobile infrastructure less network .It employs the on demand routing methodology for formation of route among nodes. AODV satisfies unicast, multicast and broadcast routing. AODV routing protocol direct packets among mobile nodes of wireless ad-hoc networks.[3]

## V. SIMULATON MODEL

In this research work, author used OPNET Guru Academic edition for our network simulations. OPNET in general is a powerful communication system simulate developed by OPNET technologies. [4]. the opnet tool provides a hierarchical graphical user interface for the definition of network nodes. A network is constructed by graphical connecting network nodes via communications links OPNET comes with a model library, including application traffic modes(eg. HTTP, FTTP, E-mail, database) protocol modes (eg. Tcp/ip, IEEE 802.11b, Ethernet).

### 1. EXPERIMENTAL SETUP

The main objective of this simulation study was to evaluate the performance analysis of QoS parameters in IEEE 802.11b In this simulation three scenario are set up in which fixed nodes are used. We make three scenarios with 5,10,20 and 50 fixed nodes. We also have a router for routing protocols and for the security purpose. Figures of these scenario are as following:

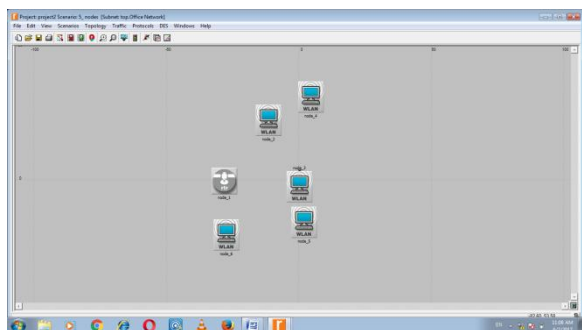


Figure.1 WLAN\_5nodes\_fixednodes

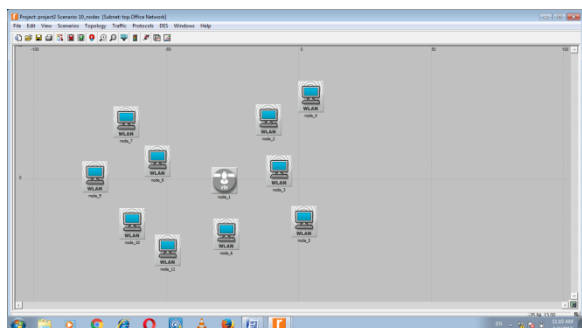


Figure. 2 WLAN\_10nodes\_fixed nodes

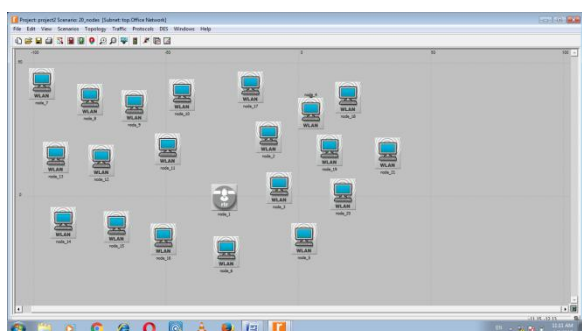


Figure. 3 WLAN\_20nodes\_fixed nodes

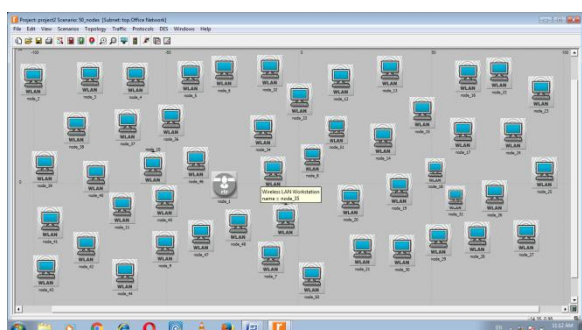


Figure..4 WLAN\_50nodes\_fixed nodes

These are three scenarios that are simulated using OPNET Simulator. In this paper throughput and packet drops and delay are compared graphically by reducing the bit rate to 512 bits from 1024 bits.

## 2. RESULTS

### 2.1 Throughput

Throughput is a measure of how many units of information a system can process in a given amount of time. It is applied broadly to systems ranging from various aspects of computer and network systems to organizations. In data transmission,

network throughput is the amount of data moved successfully from one place to another in a given time period and typically measured in bits per second(bps), as in megabits per second(mbps), or gigabits per second(gbps).[5].

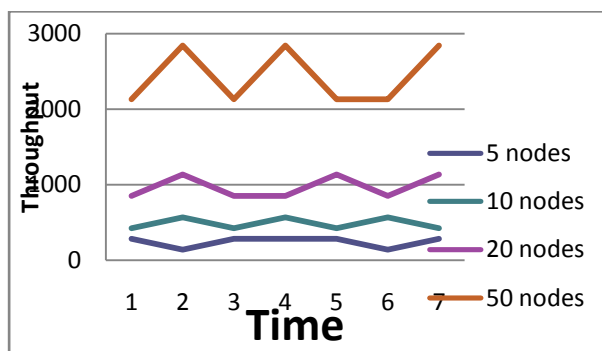


Figure. 1Throughput of fixed nodes

### 2.2 PACKET DROP

Packet drop or packet loss is the failure of packets which have data to reach their destination. Due to some delay or other problems in the network some time packets will drop in their path and loss all the data and does not reach their destination.

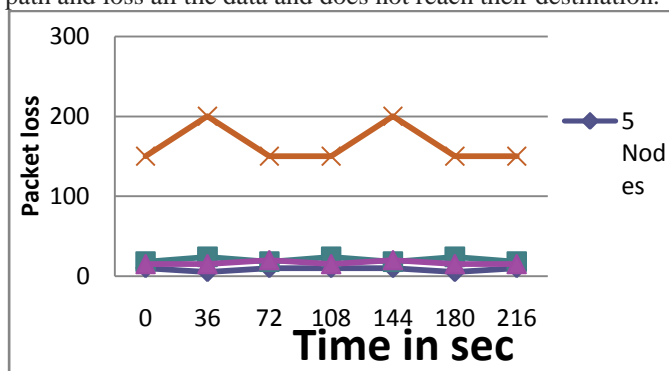
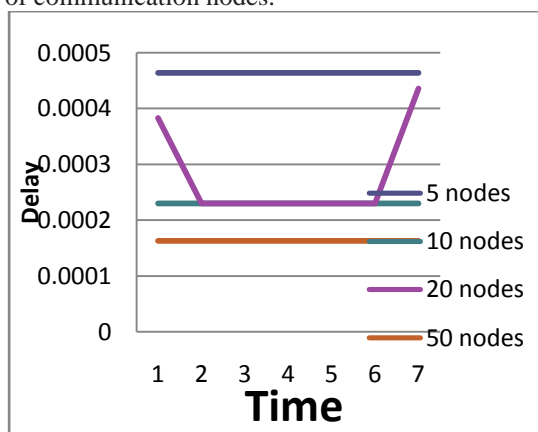


Figure. 2. Packet loss

### 2.3 Delay

It is a performance characteristics of a telecommunication network. The delay of data is represent how long it takes for a bit of data to travel across the network from one destination to the another destination. Delay is depending on the number of pairs of communication nodes.



## VI. CONCLUSION AND FUTURE WORK

In this research paper author present a set of simulation experiments on IEEE 802.11b with security parameters. OPNET

IT which have very good and easy steps for execution of the scenarios. This OPNET software is very easy to understand for the researches. The execute experiment on WLAN 802.11b with security parameters are out of the range of a WLAN. Experiments are based on the IEEE 802.11b standard which is commonly used. We plan to further extend this work by change in data rates and other security parameters for best and high or low rates. OPNET simulation tool is the best simulation tool to attract the students.

## VII. REFERENCES

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