# Secure Bandwidth Division In Wireless Router

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**Abstract**

*Internet broadband access became a major potential application, it is important to perfectly allocate the limited bandwidth to all users. Hence, throughput and fairness are the primary concerns in WSN's rather than power efficiency and mobility. The devices that are connected are identified and according to it the bandwidth is distributed to them by the service provider. This provides higher efficiency of bandwidth. Administration of bandwidth division is done through software build for standard routers. Java swing is interface used for control. Using Http socket class the packets are controlled. In this project we also provided security to software from hackers as well as provide secure access to genuine users. In this paper we also limit maximum and minimum number of users.*

*Keywords- WMN-Wireless Mesh Network, Security, client server, bandwidth allocation, Packets etc.*

## I INTRODUCTION

A network is a wireless network consisting of sensor adjusting to space distributed among independent devices using sensors to co-operate and monitor physical or environmental conditions, such as motion or pollutants temperature, sound, vibration, pressure, at different locations. The military applications also uses this developed wireless sensor networks like battlefield surveillance. Wireless sensor networks are used in many various application areas, including security monitoring and environment, home automation, health-care applications and traffic control. Apart from these one or more sensors, each node in a sensor network is typically equipped with a radio transceiver or in other wireless communications device, use of small micro controller, and an energy source is done. The forecasted size of a single sensor node can vary from devices the size of grain of dust, although functioning 'motes' of genuine microscopic dimensions have yet to be created to shoe-box-sized nodes. The cost of sensor nodes is similarly variable, ranging from hundreds of dollars to a few cents, depends on the size of the sensor network and the complexity of individual sensor nodes. Size and cost constraints on sensor nodes result in constraints on resources such as energy, memory, computational speed and bandwidth respectively. Bandwidth allocation can be defined as the process of granting individual transmission opportunities to the users. We give specifically allocate bandwidth to users according to usage of users. Users are also provided with security. Provision is made for temporary user and software restricts non genuine users. This is done by blocking the Mac

address of such user automatically by the software. We also set the data transmission limit of that user. By use of Http socket class packet ( ). We set downloading limit for given temporary user.

The bandwidth division system act as a firewall when invalid users try to access the network they get blocked because they are not genuine users. This provides greater security aspect to the genuine users and gives fair, secure bandwidth division system.

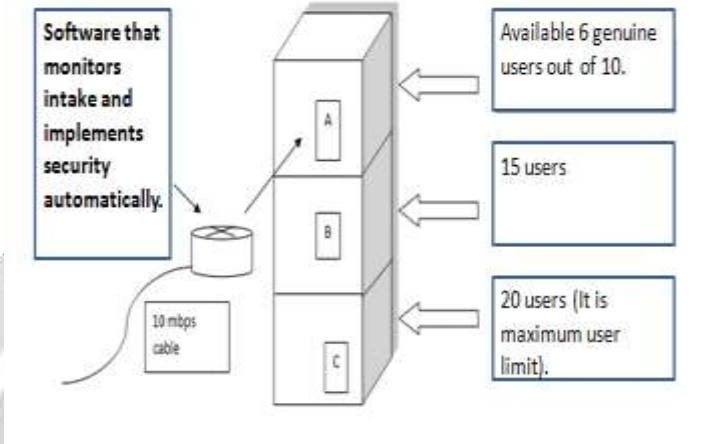


Fig1: Division of bandwidth

## II LITERATURE REVIEW

In this survey proposed by Rong He, Hui Xie EPON is a promising solution for today's generation broadband access network which gives good convergence between low-cost Ethernet equipment and fiber infrastructure. [1]

In this paper the problem of providing QoS support for real-time flow of application is given, when bandwidth is allocated according to valid usage. A framework that joins QoS support together with fair rate allocation is proposed by protocol QUOTA (quality-of-service aware fair rate allocation) .A priority to real-time flow of application is higher than elastic flows is proposed by framework QUOTA that provides reserving the necessary bandwidth for the former and fairly allocating the left-over bandwidth .[2]

In the paper survey is done on the most important and promising hybrid wireless-optical access solutions. Hybrid architectures, new converged implementation solutions, connection options, bandwidth allocation, and algorithms for resource are features covered. Quality of service (QoS) provisioning strategies as well as QoS-aware policies is given special focus. Moreover, we intend to look at new trends and solve flaws relevant to the wireless optical integration accomplishment, open challenges in the relevant area, and design, operation, and optimization chances. The protocols, algorithms, and schemes providing combined bandwidth allocation solutions are identified, discussed, and classified. [3]

Stationary wireless routers are Wireless mesh networks (WMN's) which are connect together by the wireless links. For wireless mobile devices Wireless routers acts as the access points (APs). Along the high speed wired links, some wireless routers work as a gateway for internet.

The data is transferred through Wireless mobile devices transfer data to the corresponding wireless router and then transferred in a multi-hop manner to the internet passing by intermediate wireless routers. [4]

In this paper Claudio Cicconetti tells us

This paper gives information about the bandwidth balancing in mesh network with lack of security. [7]

Affordable solution for wide range broadband Internet access is described in Wireless mesh network by Jian Tang describes in paper. As well as we study bandwidth allocation in multi-channel multihop wireless mesh networks has been studied. The main goals of our system are to increase the network throughput and, also to enhance fairness.

To solve the maximum throughput Bandwidth Allocation (MBA) problem, the paper presents a Linear Programming (LP) formulation. However, simply increasing the throughput will lead to a severe bias on bandwidth allocation among wireless mesh nodes. For achieving a good tradeoff within fairness and throughput, simple max-min fairness model is needed to be considered that leads to high throughput solutions also having guaranteed min max bandwidth. [10]

## III SYSTEM REQUIRMENT

**Hardware:**

Processor -Pentium IV 1.4 GHz
Ram - 512 Mb dd ram

**Software:**

Front End : Java, Swing
Back End : MS Access
Tools Used : JFrameBuilder
Operating System: WindowsXP

## IV PROPOSED SYSTEM

Bandwidth allocation can be defined as the process of granting individual transmission opportunities to the users. We give specifically allocate bandwidth to users according to usage of users. Users are also provided with security. Provision is made for temporary user and software restricts non genuine users. This is done by blocking the Mac address of such user automatically by the software. We also set the data transmission limit of that user. By use of Httpsocket class packet ( ) we set downloading limit for given temporary user.

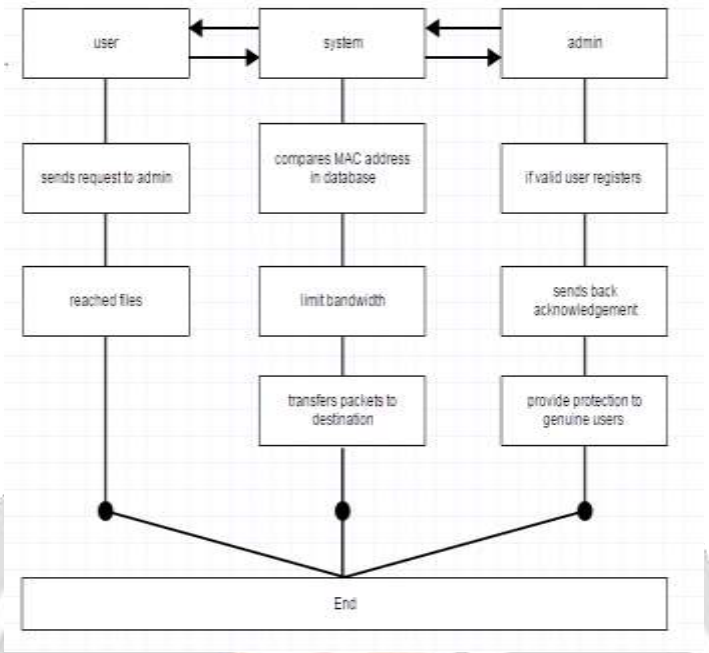


Fig2: System Architecture

**Modules**

- Client server model
- Packet controlling
- Admission Control Mechanism

**Algorithm**

Login

Get Areq (U) , i =1, 2,..., N,

Get Aavi(U)

Calculate req (U) i =1, 2,...,N

if (U) == 0 offer ,Then

iacti (U), b = available bandwidth

if (U)= temporary ,then

Limit packet supply

Else

i=deacti;

end

end if

**How does process takes place-**

Step1: Log-in from admin control mechanism.
Step2: Run software.
Step3: Select node from data set.
Step4:Get hostname using class intent address.
Step5: Establish connection.
Step6: Control packets using httpsocket.
Step7: Set data rate using Datagram Packet function.
Step8: If errors repeat from step3.
Step9: Exit.

**Client Server model-**

The main server is admin which can controls the many routers. Information of user is stored in database. User if payed then MAC address is compared to value in database. This comparison is done by admin. Client server is secured by firewall which prevents hackers. For first time user, a user needs to contact admin to register in database and hence connection can be established. The client is no of users which can be connected to server.

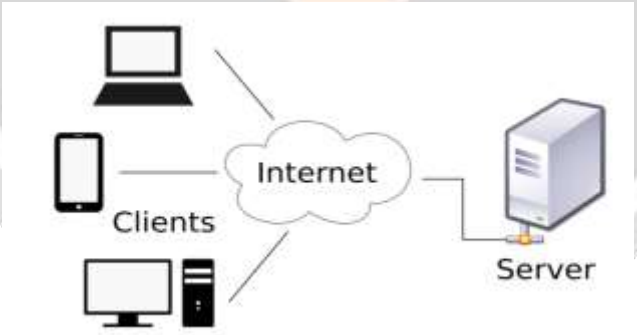


Fig: 3 Client server model

**Admission Control Mechanism-**

- Packet controlling for temporary user - Temporary user should have limit to accessing of data.
- Bandwidth division – Divide bandwidth among genuine users.
- Security for genuine users- The software provides two kinds of security one is to prevent from hackers and second is invalid users.

- Maximum and minimum user- It limits maximum and minimum users. For ex- if we set limit for bandwidth division is 20 users then no more than 20 users are permitted.

- Adding and deleting users and admin – Admin can add, delete users. Admin also can add another user as an admin.

**Packet Controlling:**

Finally, after understanding and determining the required delays for different users, the packets that are received are then sent to the respective destinations by the data rate required by inserting delays between transmissions of each packet. The packets after finding out the Network Interface address and then sending the packets to that NIC. The libraries used for sending packets are jpcap and winpcap.

**Windows GUI**:

The interface of the users with software will be windows-based. It is necessary that our software is compatible to already used software so that it can reach maximum market possible. In a server, specifically, the launch of operating systems such as windows means that our software need to meet and be compatible with "Windows" standards so that high volume of customers can be reached. The user interface with windows will be easier or simpler to use as well as training can be provided if required.

**Software Control:**

This is one of the most important objectives of our project as we need to reduce bandwidth consumption of programs directly that may be of great importance in a work environment. For example, in advertising companies, where high-end programs are used for downloading, sharing and transfer of information among workstations, it is necessary to have a certain quantity of bandwidth available. Recently, it has been found that the use of unimportant programs such as Kazaa, Grokster, WinMX and others has been growing among employees. These programs taking valuable resources away from the company, which is investing its cash in a fast internet connection.

**Data Transfer Rate:**

The data send and received bytes per second will be monitored and controlled by software. For making it simpler for the network manager, an added or new feature can be designed in the future where one may be able to create rules and filters that could regulate more easily and efficiently in manner certain programs transmit data. Certain constraints are recognized when we are designing the project. As this project is being created for the reason of efficiently conserving bandwidth, the program should not impede on the data communications. Since the design calls for the host machines need to be continuously connected to the database, bandwidth will be used during such transfer. This needed to be monitored and programmed efficiently.

## V RESULT AND DISCUSSION

In dynamic bandwidth allocation using polling mechanisms the users requesting the bandwidth are given priority.The idle time occured while utilization of bandwidth is provided to other applications.Here a medium traffic load is handled which improves the network performance in terms of packet delay, queue length, and bandwidth utilization as compared with a well- known efficient DBA algorithm proposed.While in our paper users are provided bandwidth by dividing bandwidth statically.The advantage over here is one single bandwidth is divided among the different users which increases throughput of bandwidth allocation.

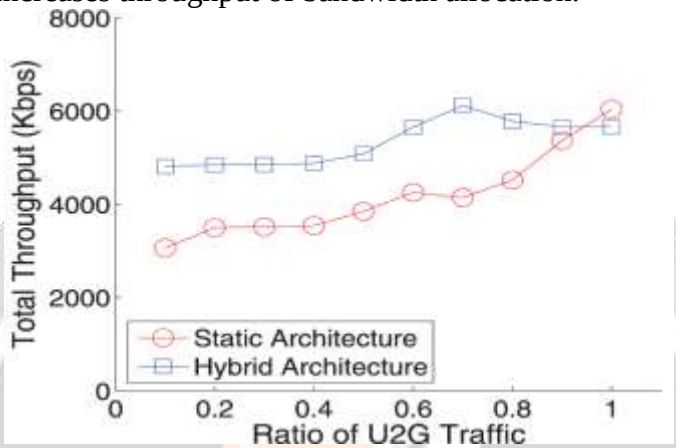


Fig 4. Static vs Hybrid bandwidth throughput utilization

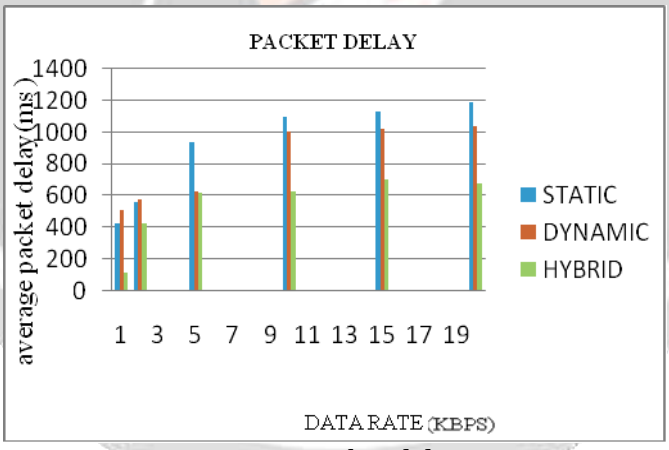


Fig 5. Packet delay

Hence no need of providing each user different bandwidth.The packet delay against data rate provided is shown as above. In this manner bandwidth usage is increased, providing security to actual user.As each user is going to use network according to bandwidth provided to him/her.If user not using network then part of bandwidth provided to him is dynamically distributed among other users.Hence security is also provided as each user is going to utilize the bandwidth i.e download/upload data by bandwidth provided from administrator after dividing it.

## VI CONCLUSION

This paper describes efficient division of bandwidth according to usage given by admin. The software configures for standard routers such as TPlink, D link etc. It is mainly used for industrial purpose or Educational Institutes. It can be used in day to day life. The algorithm is more efficient and secure than other static bandwidth division algorithm.

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