International Journal Of Scientific & Engineering Research, Volume 10, Issue 3 , March 2019
ISSN 2229-5518

BANDWIDTH MANAGEMENT IN ROUTER FOR DHCP PROTOCOL

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Abstract

Network management and Performance management can be categorized as Bandwidth management. The process of administering and managing computer networks are Network management (NM) [1]. Ensuring that goals in an effective and efficient manner are consistently being met by Performance management (PM) includes activities. Network management & Performance management can focus on the performance of an organization, a department, employee, or even the processes to build a product or service [2],[3]. Now we take a look about Bandwidth management in various Routers in network management and performance management level [4] and to solve the way in which they can go against or to solve the technological allegation at non Wifi Router about their functional limitations in DHCP Protocol. In computer network where IP are assign in a Static (IPV4) way the Bandwidth management can be done in a good way but IP conflict arise when two pc have the same IP. But to avoid IP conflict when the network is in DHCP protocol where IP is assign in a random way, Bandwidth for a specific IP cannot be done properly.

Keywords: Bandwidth, DHCP, IP, Limitation, Management, Network, Router, Solve

1. Introduction to Bandwidth Management:

The maximum rate of data transfer across a given path is called Bandwidth. Bandwidth may be characterized as network bandwidth, data bandwidth. In a digital communication system The term bandwidth sometimes defines the net bit rate 'peak bit rate', 'information rate,' or physical layer 'useful bit rate'), channel capacity, or the maximum throughput of a logical or physical communication path. Measurement the maximum throughput of a computer network is called Bandwidth test [5].The term Bandwidth is often incorrectly used to describe the amount of data within a prescribed period of time transferred to or from the website or server. Bandwidth consumption accumulated over a month measured in gigabytes per month [6],[7].For this meaning the more accurate phrase used of a maximum amount of data transfer each month or given period is monthly data transfer [8],[9]. Bandwidth management is done in present days only by IP to IP and for a block of IP where bandwidth divided by the same limit to all IP **[Figure 1].**

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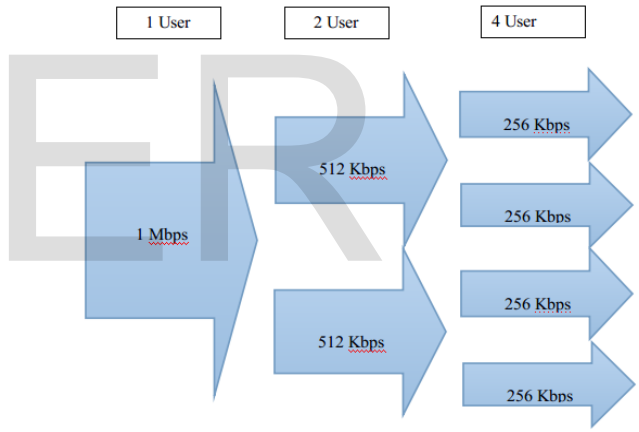

Figure 1

In **[Figure 1]** Bandwidth is distributed equally to all IP or hosts.

2.Fundamental of Non Wifi Router Bandwidth management:

Through the internet data sent, such as a web page or email, is in the form of data packets. Two or more data lines from different networks is connected by a router [10]. When a data packet comes in on one of the lines, in the router reads the network address information in the packet to determine the ultimate destination of packet. Then using the information it directs the packet to the next network on its journey by using its routing table or routing policy, [11],[12]**[Figure 2]**.

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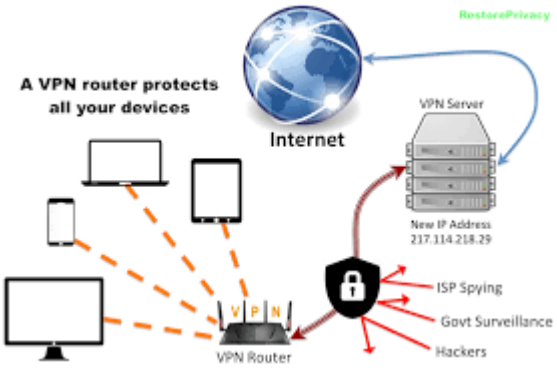

Figure 2

In **[Figure 2]** Router distributes bandwidth to all IP equally by wifi router.

A Non Wifi Router may have interfaces for different types of physical layer connections, such as copper cables, fiber optic, or wireless transmission. It can support different network layer transmission standards also. Each network interface is used to able data packets to be forwarded from one transmission system to another [13]. To connect two or more logical groups of computer devices known as subnets, routers may also be used for this, each with a different network prefix. Non Wifi Router may provide connectivity within enterprises, between enterprises and the Internet, or between internet service providers' (ISPs') networks [14],[15].All Routers are functions on Bandwidth Management with only on Static IP.

3.Bandwidth Management and Routers and Static IP:

Router plays only with IP address. Switch plays with Mac address. When a Bandwidth is troughed over a Router, it can be able to limit Bandwidth only on one IP address or a block of IP addresses separately which connected to the Workstation via Hub or Switch **[Fgure 3]**.

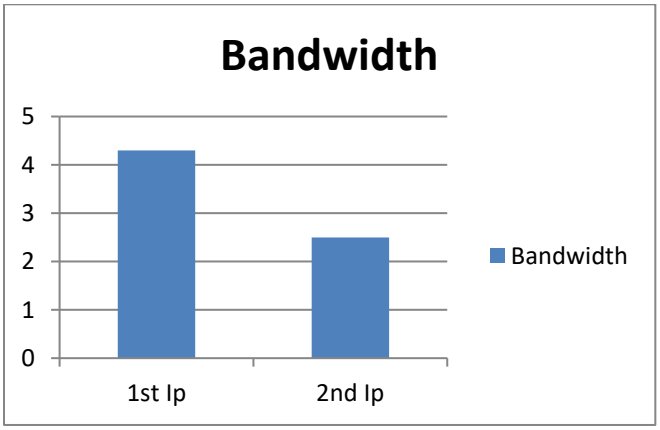

Figure 3

In **[Figure 3]** 2 **IP** use bandwidth with different quantity as per their use but assigned bandwidth is equal.

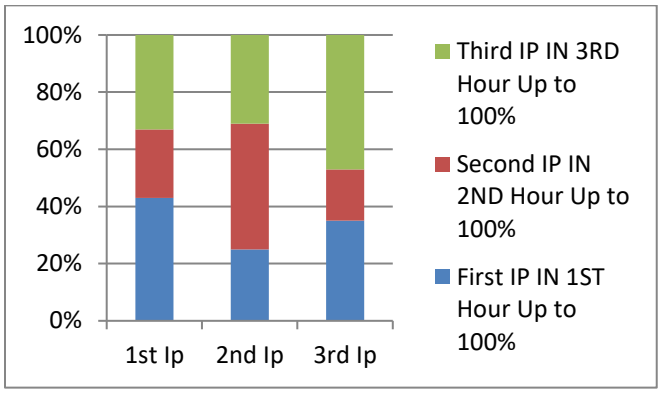

Figure 4

In **[Figure 4]** 3 **IPS** use Bandwidth with different quantity as they can able to take the maximum they can from a declared limited Bandwidth of 100%.

Non Wifi Microtik Router works on IP & also in some cases on MAC Address [15], Non Wifi Cisco Router limits Bandwidth IP to IP separately & often on a block of IP addresses jointly [16], Non Wifi Juniper also same & able to through Bandwidth on a block of IP addresses from a Router port (multicast) to Switch [17], Non Wifi Palo Alto same as Juniper [18],[19]. Non Wifi Fortinet same as Palo Alto. All are for **STATIC** IP addresses [20]. Here we find two designs, Bandwidth management for IP to IP [Figure 5], and for block of same class IP addresses [Figure 6].

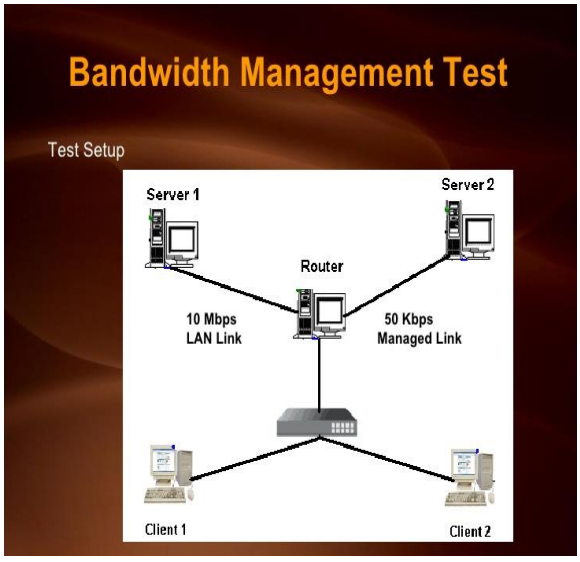

Figure 5

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In **[Figure 5]** Bandwidth management for IP to IP equally.

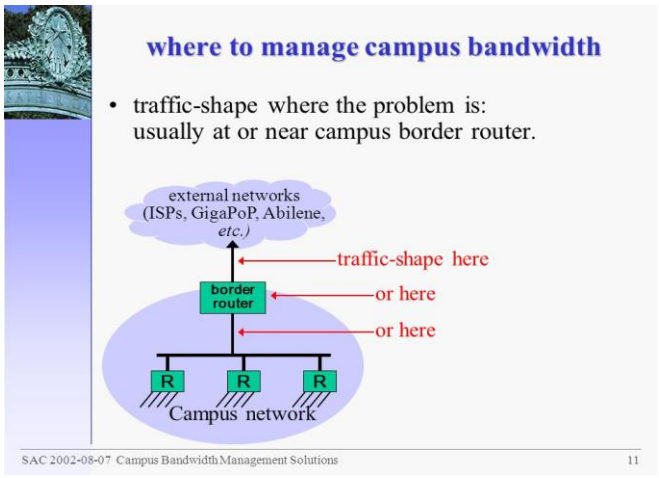

Figure 6

In **[Figure 6]** Bandwidth management for a block of same IP equally

4. Bandwidth Management Limitation in DHCP protocol

Client/Server protocol is Dynamic Host Configuration Protocol (**DHCP**) that automatically provides an Internet Protocol (IP) to host with its IP address [21]. This means that a new computer can be added to a network without the hassle of manually assigning it a unique IP address or the existing network has IP automatically when it powered on. Many ISP use dynamic IP addressing for Internet subscribers [22],[23]. Bandwidth management Problem arises when IP distributions are on DHCP protocol where IP changes randomly when workstations start every time & allocated bandwidth which are separately assigned for each IP, changes in a unmanageable way.

5. Solve

Bandwidth management For **DHCP** Protocol need (proposed) to be used two Routers one after another for [Figure 4] (assumed to be **DHCP**) to turn [Figure 3] (assumed to be **STATIC**)**[Figure 7].**

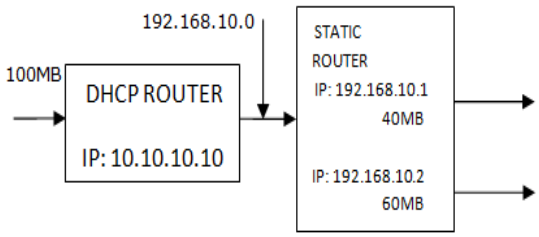

Figure 7

In [**Figure 7**] 1st **DHCP** Protocol Router takes the real IP with a Bandwidth 100 mb and 2nd Router distributes 100 mb Bandwidth to static IP Differently.

6. Conclusion

Without going into too many details, DHCP enables router to assign IP addresses to network systems which connect the computers, servers differently assign time to time when it restarts [24],[25].This is the fundamentals of **DHCP** protocol [26].

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