



Campus Network Design

Sudhir Shukla

Electronics and Communication Engineering

Buddha Institute of Technology

Gorakhpur, India

sudhir482bit@gmail.com

Ayushi Sharma

Electronics and Communication Engineering

Buddha Institute of Technology

Gorakhpur, India

bit18ec105@bit.ac.in

Mansi Kannaujiya

Electronics and Communication Engineering

Buddha Institute of Technology

Gorakhpur, India

bit18ec117@bit.ac.in

Manisha Sahani

Electronics and Communication Engineering

Buddha Institute of Technology

Gorakhpur, India

bit18ec125@bit.ac.in

Abstract— This project is to design a suitable network system for universities, school, and companies in developing countries. The aim was to design a network with high security. This project will help to enhance knowledge and learn different things of developing countries. The advantages of networking can be seen clearly in terms of efficiency, security, manageability and cost as it allows collaboration between users in a wide area. To improve college campus network design, the technology used was creating LAN, WLAN and cheap device to reduce cost of the network. But the network can also become better using routing protocols and other protocol. So, we are going to use such protocols using less number of devices and will also maintain the cost of the network less. To design such network, we are going to use software Cisco-Packet Tracer.

Keywords— *Colleges and Universities, New Network Technology, College Campus Network, Wireless Coverage.*

Introduction

Networking is referred as connecting computers electronically for the purpose of sharing information. The aim was to design a network with high security. Resources such as a file, application, printers & software are some common information shared in a networking. The advantages of networking can be seen clearly in terms of

security, efficiency, manageability & a cost effective which allows to collaborate with wide range. The Switches and Router this device that play an important role in data transfer from one place to another using different technology such as a radio waves & wire.

LAN is a Local Area network which is made up of two or more computers connected together in a short distance usually at home, offices buildings or school. WAN is a Wide Area network that covers wider area than LAN and usually covers cities, countries and the whole world . Some times Several major LAN can be connected together to form a WAN. AS a several devices are connected to network , it is important to ensure data collision does not happen when this device attempt to use data channel simultaneously. A set of rules called collision detection are used to detect and prevent collision in networks.

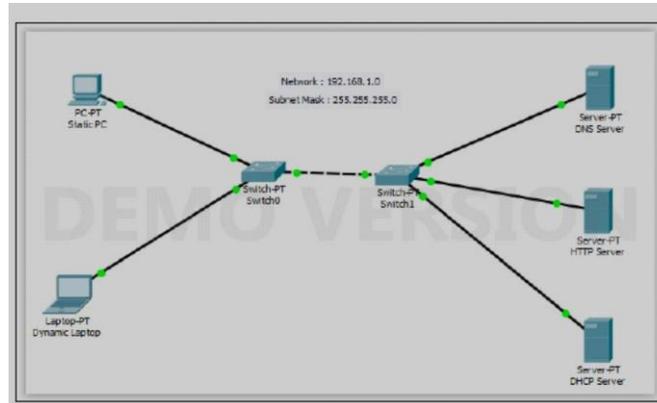
- Literature survey

- In paper [1] ‘Enhancing the College Network’ , by Jagdish K.P and Pavan Kumar, they had discussed about the advanced network through integrating IOT devices with classical device using CISCO-PACKET Tracer simulation software version 7.0 The technology focused in this paper Virtual Local Area Network(VLAN) and IOT devices likes software sensors, actuator for virtual communication. The count of device numbers is more, so to avoid large number of devices we are replacing router with layer 3 switches. By which the count of router and switches will reduce and hence the cost of network.
- In paper [2] ‘Wireless LAN security Threats and Vulnerabilities’ , by Md. Maliullah had discussed about various security issues and common threats in wireless LAN. This paper contains information of attacks like confidentiality , integrity, availability, access control and authentication. So, the main focus was on to prevent the network from the unauthorized person and hackers. But by using WLAN the risk of hacking and attacks of threats increases, hence to avoid these and to make the network more secure we can implement Network Address Translation (NAT) which will hide the private IP address.
- In paper [3] ‘College Campus Network Design and Security’ , by Shivam Adke and Rutujia Bhawar, focused on network security to protect the digital the digital information, by creating LAN network and preventing the network from unauthorized user by using firewall. Due to use of hardware firewall the design of network becomes a bit complicated so to solve this issue we can use protocol likes Access Control List (ACL) which is used to filter network traffic such a routers and firewalls.
- In paper [4] ‘ Design And Implementation of Secure Campus Network’ , by Mohamed Nadir Bin Ali, Mohamed Emran Hossain, Md. Masud Parvez , focused on the core issues of the security of the security of the network architecture. They also try to do apply simple network design, so that they can maintain the network, increased the security with the result of the network . the technology focused by them was LAN and WAN and for security they used firewall so we can also use other protocols.
- In this paper we studied regarding network, such as how different universities design a network with high quality security and low cost by using DHCP, network used WLAN technology so that data must be accessed by the authorized individuals. But while studying these we came through some drawbacks likes increased congestion on a particular group of IP’s not necessary/optional, various cost minimized in order to maximize the quality of the network, we can have greater availability of wireless LAN etc. also the protocols used were less, by using various protocols the network can becomes more enhanced and hence we can obtain the required network with more security more life span of network and encryption will be more secure. By analyzing we came with the solution with includes better routing protocol (EIGRP), various protocols likes HSRP, NAT, ACL, and PORT SECURITY and also tired to minimize the count of the devices so that the cost of network would become less costly.

- Methodology

The main aim of this paper is to make a high security and low cost network with the help of Cisco-Packet Tracer . To improve college campus network design, the technology used was creating LAN, WLAN and using cheap device to reduce cost of the network. In this growing network area, it has become necessary to protect our network from unauthorized users and prevent it from hacking, so it is necessary to maintain security in our network by using various security option like port security ,encryption using most secure routing protocol. To implement this, we need best devices which can support these protocols more efficiently.

- **Fig: Block Diagram of the proposed system**



- Experimental

The design of college campus network proposed in this paper. The validity of the campus network design and planning is verified. The campus wireless network uses an AP wireless network constructed by a company in order to ensure easy management and security of the wireless network

- Conclusion

This project has proven that a standard network system can be designed with less cost. Although we used the cheapest devices in designing the network, the security of this network turned out to quality .All networks need many servers for doing their work. For this research,we did not use all servers because of cost, but we used some important servers such as DHCP. These servers help the network to perform their function in a smooth way. It can be seen in this research that various may have been some challenges in this project due to some financial constraints, at the end our aim was achieved by designing a network for developing universities with minimal cost. for example ,we made use of some devices for the network security , but the most interesting part is that, at the end of the day, all challenges and constraints were overcomes.

References

- [1] Jagdish K.P & Pavan Kumar, 'Enhancing the college Network', Department of computer science and information science Engineering, Sri Krishna Institute of Technology Bangalore IJIRSET-International Journal of Innovative Resarch in Science, Engineering and Technology, ISSN(online): 2319-8753,Vol.7, May 20
- [2] Md. Waliullah,'wireless LAN Security Threats & Vulnerabilities',Department of Computer Science &Engineering , IJACSA-Internation Journal of Advanced Computer Science & Application ,Vol.5,2014.
- [3] Shivam Adke & Rutuja Bhawar ,'College Campus Network Design and Security',Department of Electronics & Telecommunication Engineering,Sandip Institute of Technology & Research centre, Nashik,IJAREEIE-International Journal of Advanced Research in Electrical,Electronics and Instrumentation Engineering ,ISSN (online):2278-8875,Vol.7,March 2018
- [4] Mohammed Nadir Bin Ali,Mohammed Emran Hossain & Md. Masud Pravez,'Design and Implementation of a Secure Campus Network',Daffodil International University, IJETAE-International Journal of Emerging Technology and Advanced Engineering, ISSN:2250-2459, Vol.5,July 2015