College Campus Network Design and Security

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ABSTRACT: The Internet is expanding with a tremendous speed so as its Security. Security is an very important field that consist of the provisions made in computer networks infrastructures, policies adopted by the network administrator to protect networks, the network-accessible resources from unauthorized access and effectiveness of measures combined together. Personal, government and business applications continue to multiply on the Internet and work-based application and services can pose security risks to individuals and to information resources of companies and government. Information is an asset that must be protected. Network security is more challenging than ever, as today's college networks becomes increasingly complex.

KEYWORDS: Internet, Network Security, Attacks, Threats.

I.INTRODUCTION

Each of the past three centuries dominated by a single new technology. The highlight of the 18th century was automation, bought about by the Industrial Revolution. 19th century was the age of the steam engine, pioneered by James Watt 20th century, the key technology was gathering, processing, and distribution of information. Among other development, we saw installation of global telephone networks, the invention of both radio and TV, the birth and growth of the Computer, the launching of communication satellites, of course, Internet. As result of technological progresses, differences between collecting, transporting and processing information are quickly disappearing. Organization with hundreds of offices spread over a world wide geographical area can examine the current status of even their most remote outpost at push of button. The demand for ever more complex information processing is growing even faster. Although the computer industry is still young compared to other industries, computers have made amazing progress in short time-frame. During the first 21 years of their existence, computer systems were extremely centralized, usually within one large room. Not infrequently, this room had glass walls, through which visitor could see and marvel at the electronics wonders inside. A medium-sized company or university may have had one or two computer, while very large institutions had at most a few dozen. The idea that within less than 35 years, more powerful computers smaller than the stamps used in postcard. The merging of computers and communications had a profound influence on the way of computer systems are organized. The pre-dominant concept of the "computer centre" as a single room with a large computer to which users brought their work, which an operator fed into the computer, is now obsolete. The old model of a single computer serving all of the organization's needs has been replaced by one in which a large number of separate, but still interconnected computers. These systems are called computers networks. Two or more computers are said to be interconnected if they are able to exchange information. The connection need not be via a copper wire - fibre optics, microwaves, IR, and even satellites can be used. They are usually connected together to make larger networks, with the Internet being the most well-known example of a network of networks.

II.LITERATURE SURVEY

Sr. No.	Title Of Paper	Authors Name	Publication Years And Detail	Technique Use	Advantage
1	Distributed Firewalls	Steven M. Bellovin	1999	distributed firewall design	Policy rules at the endpoints rather than a single entry point to network.
2	Wireless LAN Security Threats & Vulnerabilities	Md. Waliullah	2014	WLAN Technology	Greater availability of wireless LAN
3	Implementing a Distributed Firewall	Ioannidis, S. and Keromytis, A.D., and Bellovin, S.M. and J.M. Smith	2000	Pull and push of network security	Computer and Communications Security

At present, internet plays a vital role in many of our daily life. It made a dramatic revolution on communication which we enjoy today. The revolution offered web appliances, e-commerce, video conferences, online gaming and so on. All these became possible and operating on the backbone called networks. On the first hand, before discussing about routing and routing protocols we'll go through and networking. Initially U.S. government funded researches on sharing information within computers for scientific and military purposes. Though there were many contributed to the foundation of internet J. C. R. Licklider was the first among them. As a leader of Information Processing Technology Office (IPTO) he demonstrated the concept of time sharing and promoted the researches and concepts on networking. Time sharing made a major evolution in the IT world. It became the basis for networking as well. Lick's successors as leaders of IPTO, Ivan Sutherland and Bob Taylor influenced by "Intergalactic Network" lead the researches of Advanced Research Projects Agency (ARPA)'s IPTO. The three people Paul Baran, Leonard Kleinrock and Donald Davies developed fundamentals for ARPANET with their own concepts such as packet switching and so on. After continuous researches on implementation of networks, the first ARPANET interconnected and became success in 1969. Being limited for military and research purposes by universities ARPANET has gone through several modifications and adopted many mechanisms. By 1990 networks gradually became for public and from their several other technologies emerged based on networks. When the networks used by general public, it began to grow massive and more complex. So there was a need for a man in the middle kind of device to handle the routes for networks. So that experts coined the device called "router". Router is a networking device used to forward the data to an interface to route the data towards its destination. Again the network administrator had to do a hectic job of adding static routes and updating each and every route in a network. For instance, if a link goes down all the routers should be updated manually to cope with it. So to handle these messy situations experts came up with the routing protocols. Though there

were plenty of contributors and technology shifts in various occasions in the industry, the above paragraphs covers the milestones in the history.

III. PROPOSED METHODOLOGY AND DISCUSSION

Need for network security: Network security is the process through which we can protect the digital information. It is so crucial for all networks must be protected from threats and the risks so that a business can achieve its fullest potential. The objective of network security is:

A. To protect the confidentiality The data must be accessed and read only by the authorized individuals or parties. It is the protection of the personal information. We can compare confidentiality with privacy. User Ids and passwords are some of the methods through which confidentiality can be protected.

B. To maintain Integrity It is the assurance of not only the information can be accessed or modifies by the authorized persons only but also the data must be accurate. Measures taken to ensure integrity include controlling the physical environment of network terminals and servers, restricting access to the data, and the maintaining authentication practices.

C. To Ensure Availability Data must be available to the authorized persons at the right time. It can be ensured that maintaining all hardware and maintaining a correctly functioning operating system environment. Regular backup must be taken, for information services that are highly critical, redundancy is appropriate method to ensure availability.

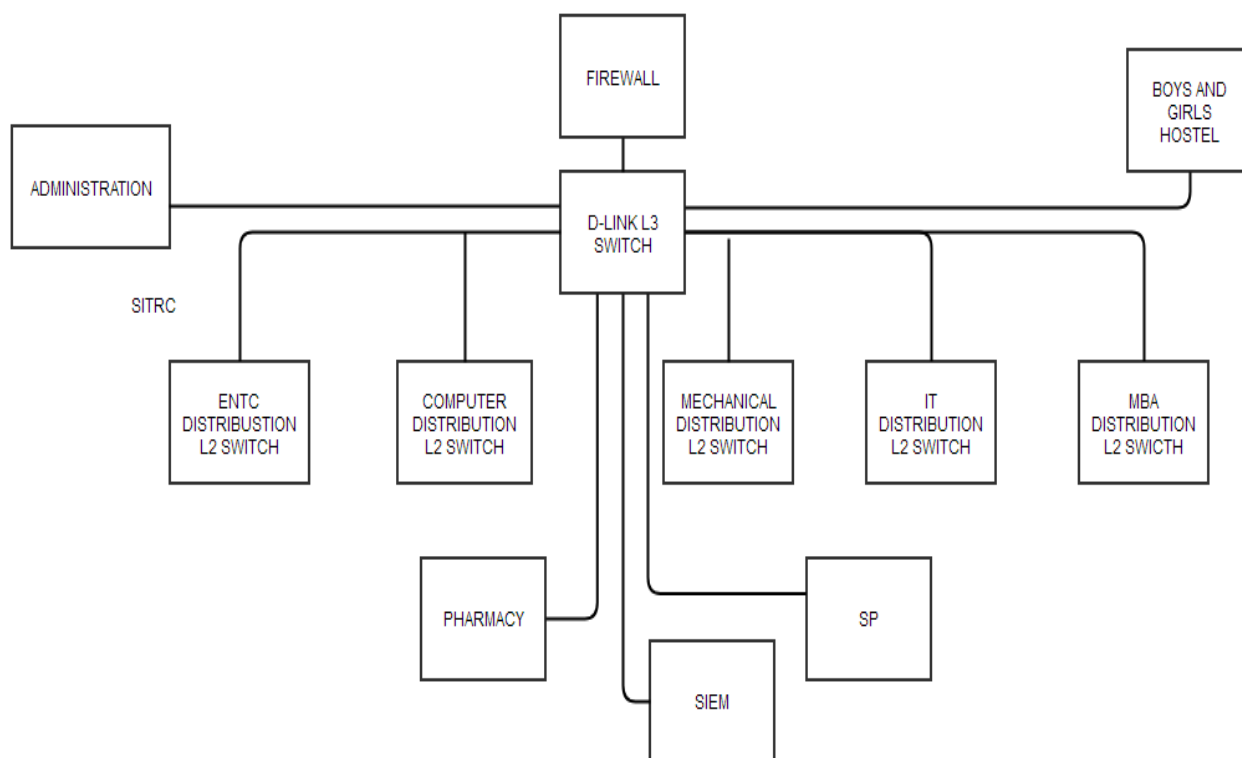### IV.EXPERIMENTAL RESULTS WITH FIGURES

A.System Development-

Fig.1 Block Diagram of Proposed System

Above diagram shows the college campus design with all the department of college. It consist of Administrator with the Firewall and L3 Switch as well as L2 distribution switch. Each department have the L2 switch for its communication with the Administrator. All the devices are connected with the CAT6 cables. Here all the operations done by the L3 switch which we can configure as need of college.

System Design : Diagram shows the college campus design with all the department of college. It consist of Administrator with the Firewall and Router as well as L2 distribution switch. Each department have the L2 switch for its communication with the Administrator. All the devices are connected with the CAT6 cables. Here all the operations done by the Router which we can configure as need of college. Needs for voice and video stream. Stackable up to (12) units under single IP, the L2 switches are able to provide a total speed of up to 576 Gbps aggregated bandwidth. To help secure your networks, the D-Link Safeguard EngineT helps prevent Denial-of-Service (DoS) attacks while the Access Control List (ACL) enhances network security

B. Result of Simulation-
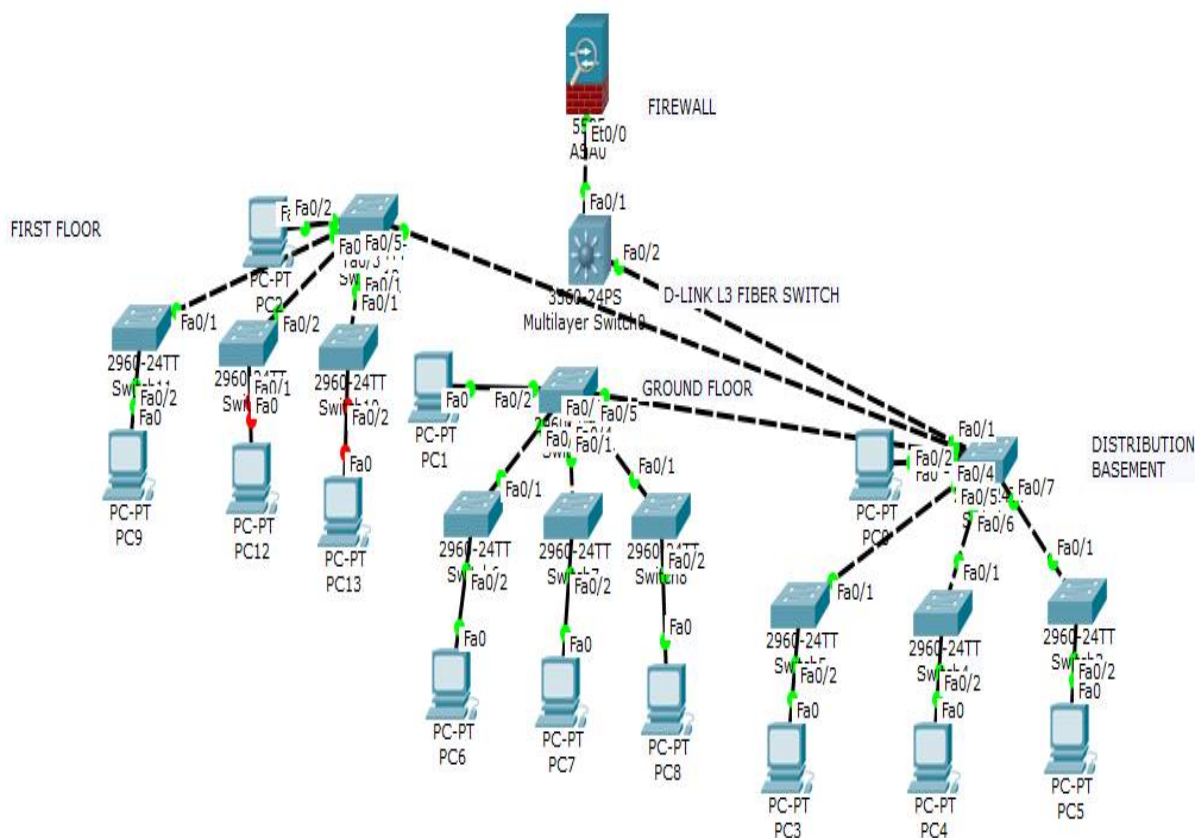
Hardware Details-
1. D-Link L3 3620 Switch
2. D-Link L2 3110
3. CAT6 Cables
4. RJ45 Connectors

Software Details-
1. Linux or Windows
2. Putty

3. Cisco Packet Tracer

V.CONCLUSION

Although it is difficult to say anything conclusive at this point of time, we can definitely say that we have much to improve upon in the future. They were not implemented in the final design. These suggestions may be taken at face value, depending upon the reader's own discretion: Sub netting are always a useful features, although may increase congestion on a particular groups of IP's not necessary/optional. Sub interfacing are again, a very useful feature, but will increase congestion on a particular group of interfaces not necessary/optional. More PCs added to each VLAN/Switch the network topology is for representation purposes only, as the PCs connected to each switch are only two in numbers, which is obviously not feasible for any institute – strongly recommended (to the point of necessity).

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