KLE Society's
KLE Technological University, Hubballi.

A Computer Networks-2 Survey Report on

VRL LOGISTICS, VARUR

submitted in partial fulfillment of the requirement for the degree of

Bachelor of Engineering
In
School of Computer Science and Engineering

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Abstract

In today's world computers have become an integral part of the business sector for professional activities not only for professional activities but for personal activities also. As technologies have evolved, networking came into the picture and slowly from initial wired network technology we moved to wireless network technology. Now if we will think then we can know that networking impacts everything.

With the help of a computer network, we can use it for communication and sharing of information between computers. Hence, the importance of connected computing devices is crucial in today's generation.

With the help of this project, we aim to improve the existing network topology in VRL as well as survey the existing network topologies and networks that exist within the campus area.

Site Plan
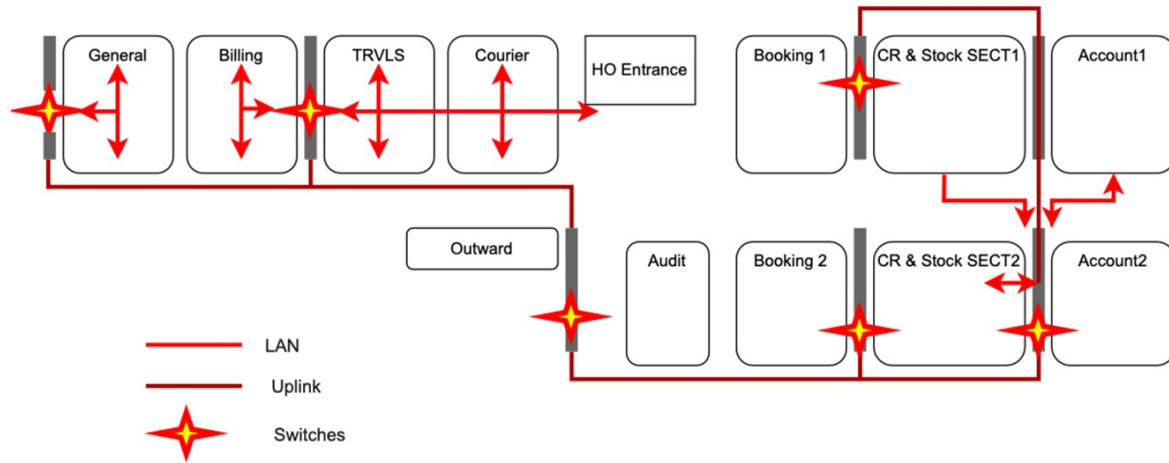
The Site Plan consists of various departments and links. Some of the departments that we were able to witness during the survey are :

1. General Department - For visitors,
2. Billing and TRVLS - It is used for billing of logistics and travel tickets for customers.
3. Courier Dept - It is to handle and track the sending and receiving of packages from several destinations to and fro around the country.
4. Audit - It is used to keep records and logs of transactions.
5. Account Dept - It is used for the finance section of the company.

Network Architecture
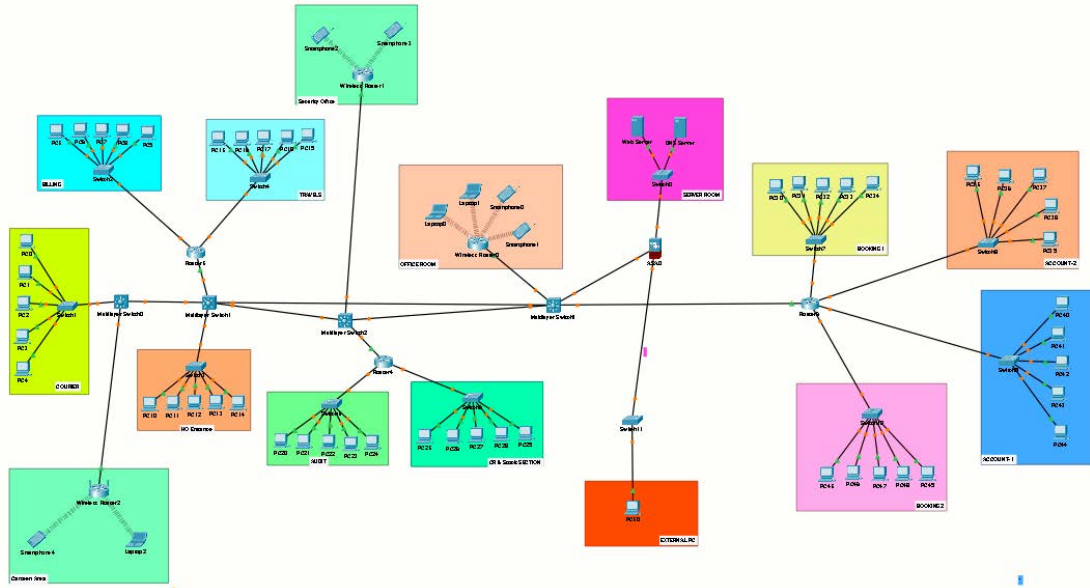
The Network Architecture consists of :

1. Multi-layer Switches (*4) - It can perform the functions of a switch as well as that of a router at incredibly fast speeds.

2. Routers (*2) - It is a switching device for networks, which is able to route network packets, based on their addresses, to other networks or devices.

3. Wireless Router (*3) - It is used for wireless connectivity of devices.

4. Switches (*12) - It is used in a wired network to connect to other devices using Ethernet cables. The switches help in communication among devices.

5. Servers (*2) - There exists 2 servers :
   a. Web Server - It is used to host the webpage and for HTTP protocol communication.
   b. DNS Server - It is used for matching website hostnames (like vrlofficial.com)to their corresponding Internet Protocol or IP addresses. The DNS server contains a database of public IP addresses and their corresponding domain names.

6. Firewall (*1) - "Cisco ASA" device is used which helps in providing firewall, antivirus, intrusion prevention, and virtual private network (VPN) capabilities. It provides proactive threat defense that stops attacks before they spread through the network.

7. End devices (*59) - It consists of Smartphones, laptops, computers etc. used to connect to the switches for communication between various network devices.
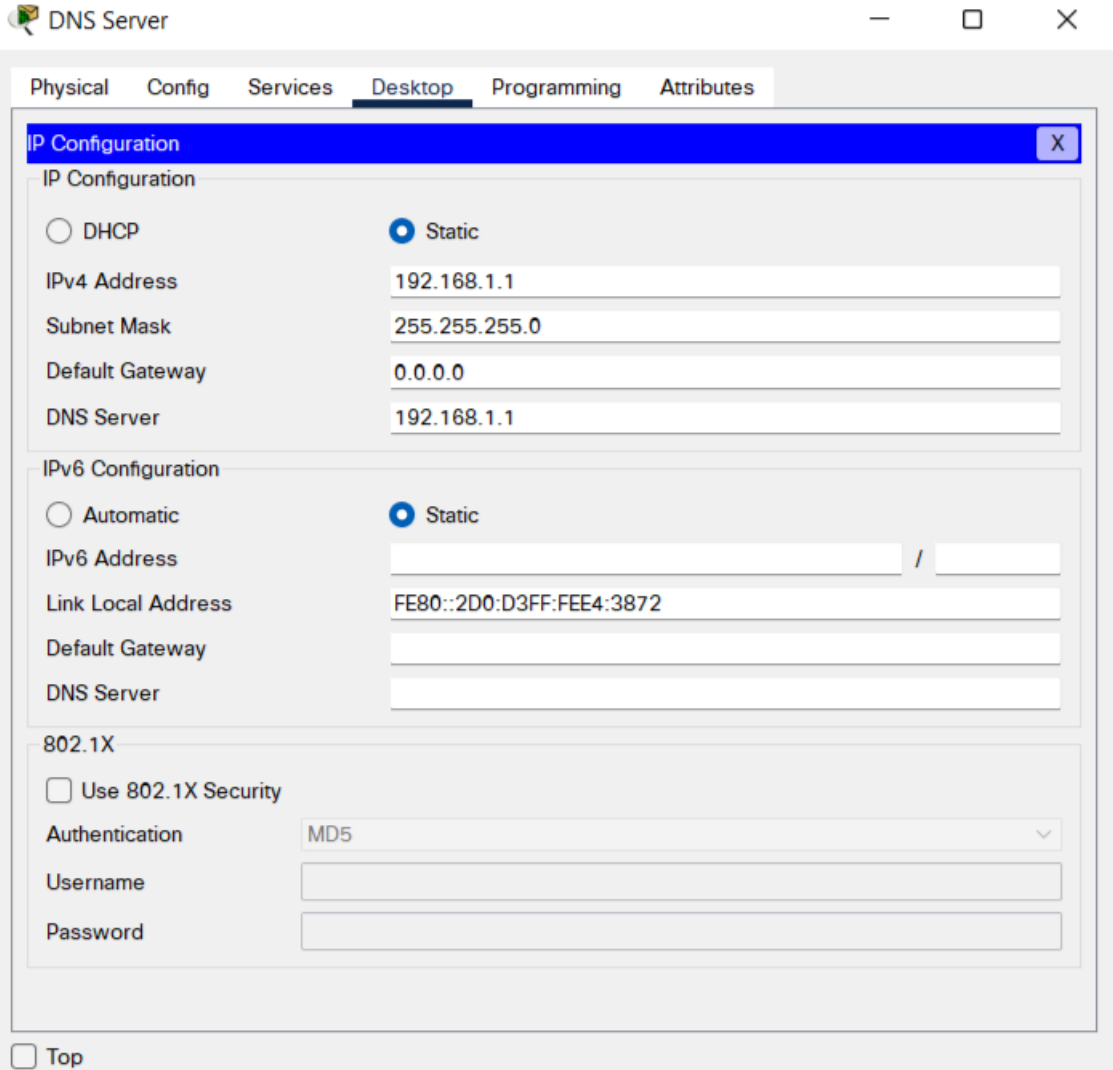
Mindmap
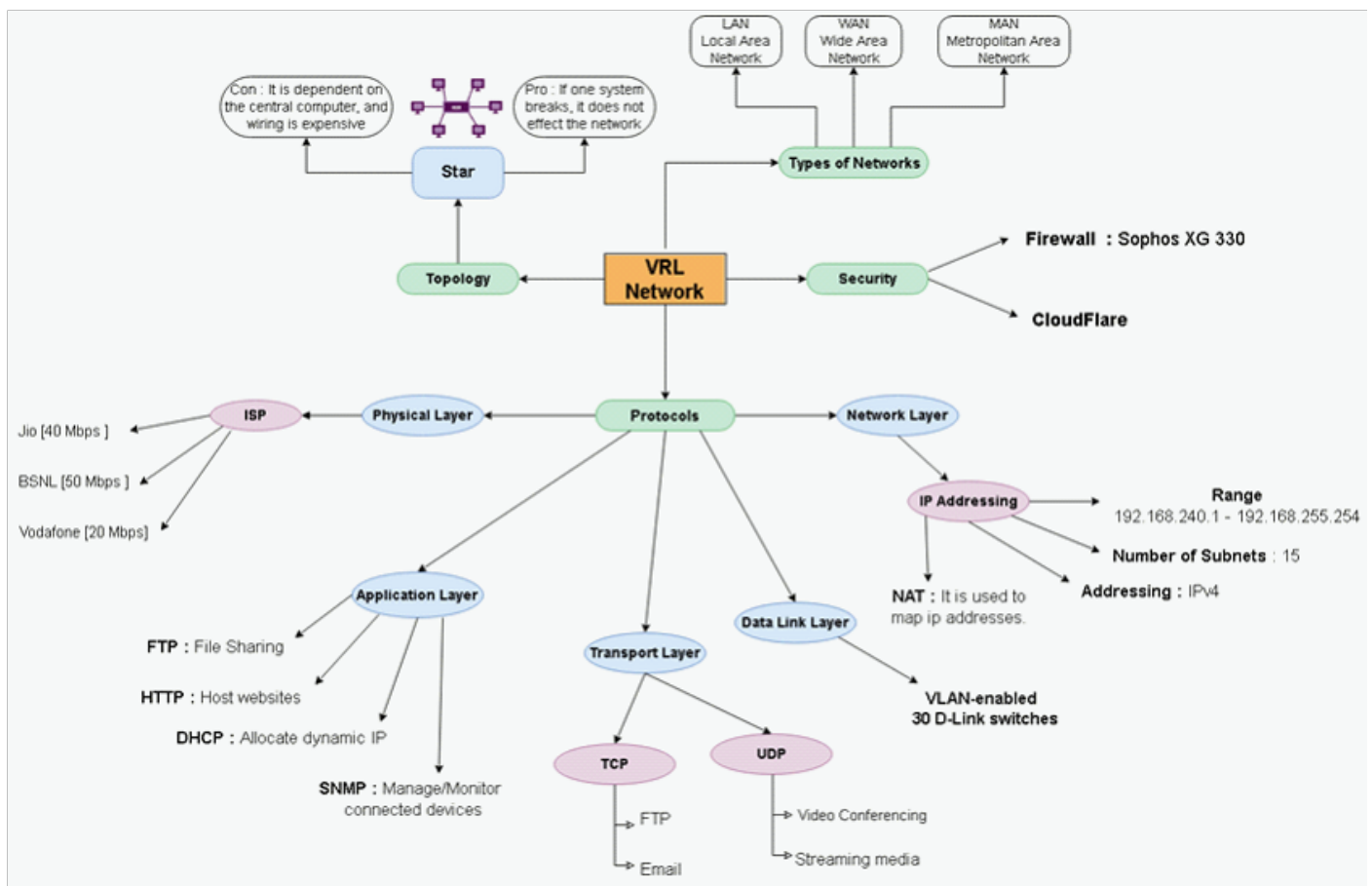
Gaps Identified

- The Load Balancer - Radware Alteon is outdated and has limited features.
- Star topology consists of a single central server, the failure of it will lead to disruption of services.
- Limited access points usage, thereby leading to limited area connectivity.
- The existing firewall "Sophos XG-330" firewall had limited capabilities and was expensive to set-up.

Proposed Solution

- In place of Radware Alteon, "F5 BigIP LTM" can be used, which offers simpler CLI and GUI.
- Full Mesh topology can be used, since it offers higher levels of redundancy.
- Instead, we used Cisco ASA, which is a security device that combines firewall, antivirus, intrusion prevention, and virtual private network (VPN) capabilities.
- More number of access points can be increased, and limited to specific range of users, thereby increasing speed.

SERVER CONFIGURATION

DNS Server

DNS Server

The DNS Server translates human-friendly domain names into machine-friendly IP addresses. In the DNS server, we have configured the IP address as 192.168.1.1 i.e Class C address. The subnet mask is 255.255.255.0.

WEB Server

Web Server

A web server is software and hardware that uses HTTP (Hypertext Transfer Protocol) and other protocols to respond to client requests made over the World Wide Web. The main job of a web server is to display website content through storing, processing and delivering web pages to users.
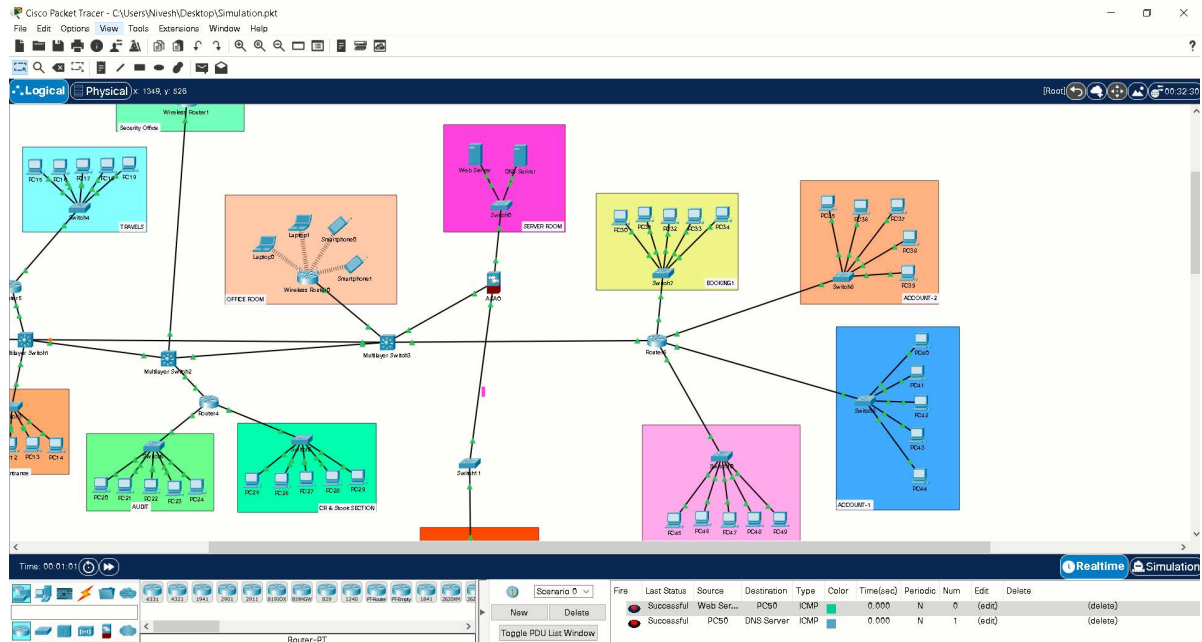
Here, we have the web page with domain name **vrlofficial** or ip address as **192.168.1.2.** Any end-device can enter the ip or domain name and access the website.
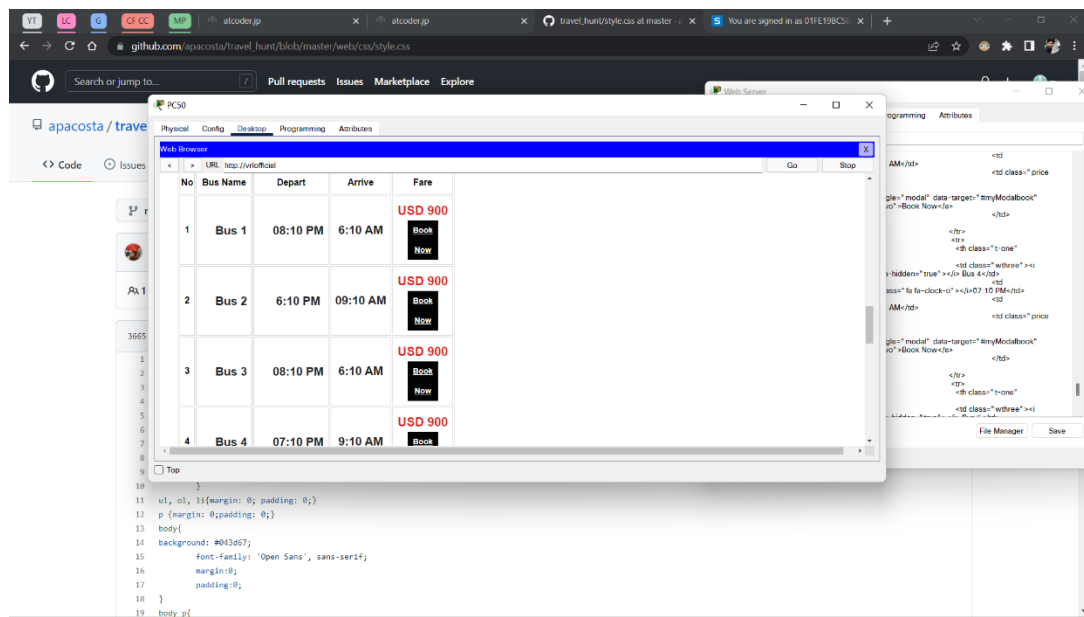
Accessing Website from an external device

Here, we can see the working of the website when accessed by an end-device.

SIMULATION

Packet transfer from external device to campus server

We can see that the packet has been successfully sent from an external device to the server that exists within the campus network area.

In the above image, we can also see that the devices are also able to ping each other in different departments within the campus network area itself.

LEARNING AND EXPERIENCES

Initially, we took a survey of the existing network topology within the campus area of VRL Varur. We observed that the campus area was relatively small and had few network devices. 20% of the campus area had physical infrastructure and lacked network devices.

Even though we faced difficulties in Cisco Packet Tracer tool, we were able to implement and simulate several network technologies based on real-time devices that were implemented. We implemented a firewall system using "Cisco ASA" device which helps in providing firewall, antivirus, intrusion prevention, and virtual private network (VPN) capabilities. It provides proactive threat defense that stops attacks before they spread through the network.

Overall, it was a good learning experience and we were exposed to a wide range of network device tools. We also thank Dr. Vijayalaxmi and all the faculty members for guiding us throughout the course project.