DESIGN AND IMPLEMENTATION OF A VIRTUAL LOCAL AREA NETWORK WITH USING CISCO OPERATING SYSTEM

Özde ÖZAŞ – Buğra YILMAZ – Esra Nur YÜCEL
Advisor – Sibel TARIYAN ÖZYER

Çankaya University, Department of Computer Engineering

Abstract

The purpose of this project is describing the and implementation of a Virtual Local Area Network with using Cisco Operating System. This design aims to design VLANs are commonly incorporated into network design making it easier for a network to support the goals of an organization. The project will cover how to code VLANs and VLAN trunks. It will also examine security considerations and strategies relating to VLANs and trunks, and best practices for VLAN implementation and design. This document includes detailed information about requirements of the project. It reflects the identified constraints and proposed software functionalities.

Key words: Virtual Local Area Network (VLAN), Cisco Operating System.

Introduction

Using VLAN technology, logical networks are created on the devices that support this technology. Cisco IOS (Internetworking Operating Systems) and Packet Tracer Simulation program will be used to coding the switches and network design in this project.

Solution

In this section, we will share our solutions to the problems that are mentioned in section of Problem Statement.
To solve this problem, we have come to conclusion that we need to use logical grouping of network users and resources on a local area network (LAN). In other words, VLAN that make easy to create and administration of logical groups which can communicate among themselves. We aim to describing and implementation of a Virtual Local Area Network with using Cisco Operating System. This design aims to design VLANs are commonly incorporated into network design making it easier for a network to support the goals of an organization. It will also examine security considerations and strategies relating to VLANs and trunks, and best practices for VLAN implementation and design. Instead of all problems, we can use VLANs to reconfigure.

VLAN names and Functions

In our project, we designed a total of 8 virtual local area networks. VLANs are named:

- Vlan1 is default Vlan.
- Vlan2 & Vlan3 are basic Vlan.
- Vlan4 is a wireless Vlan.
- Vlan5 is a VOIP Vlan.
- Vlan6 is a VOIP data Vlan.
- Vlan90 is a native Vlan.
- Vlan99 is a management Vlan.

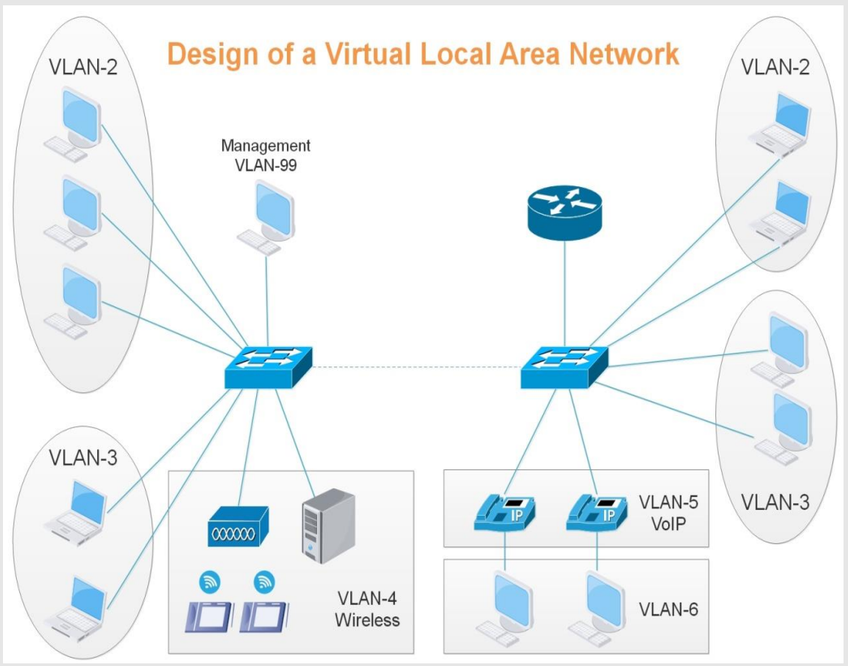

Figure 1 – Design of a VLAN

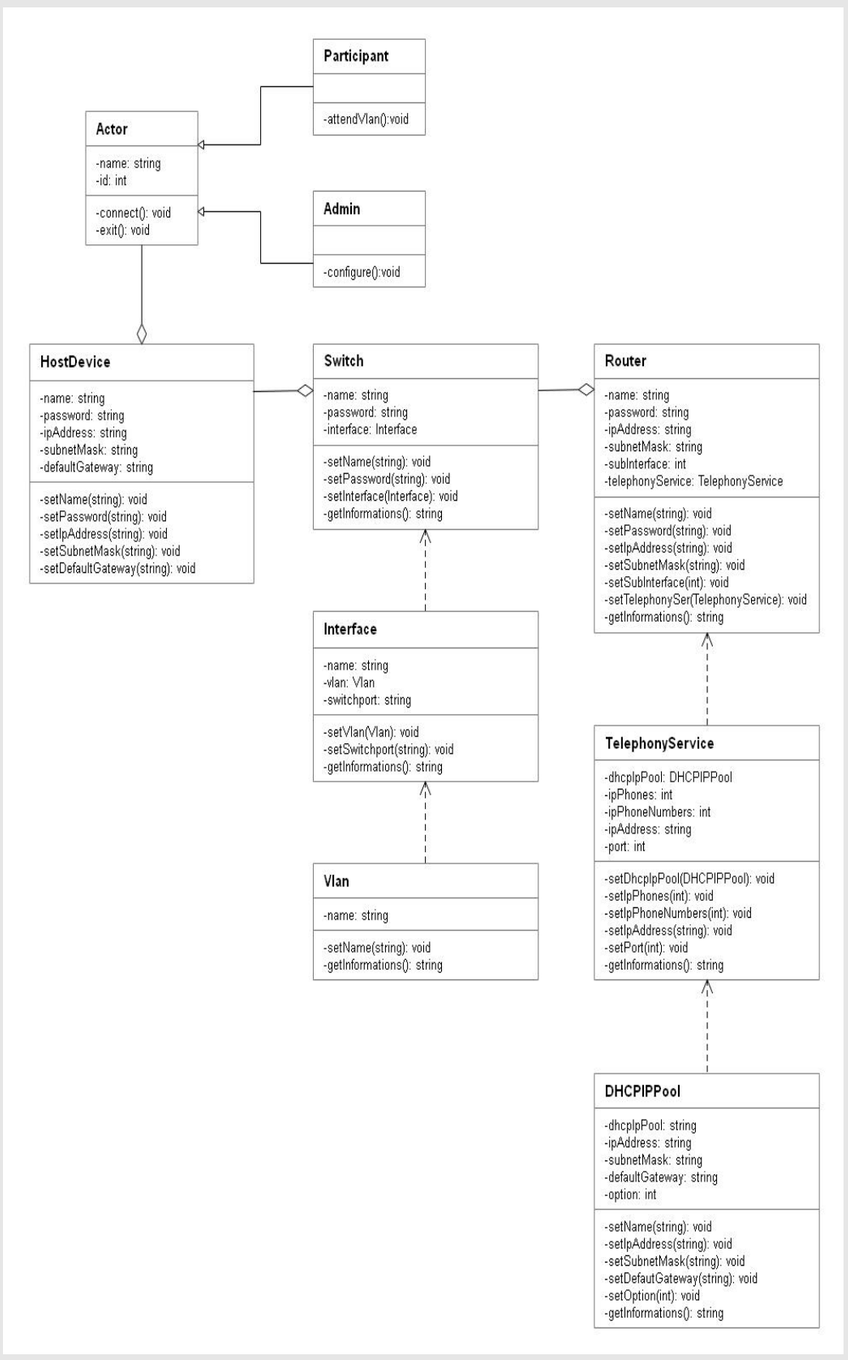

Figure 2 –Class Diagram of a VLAN

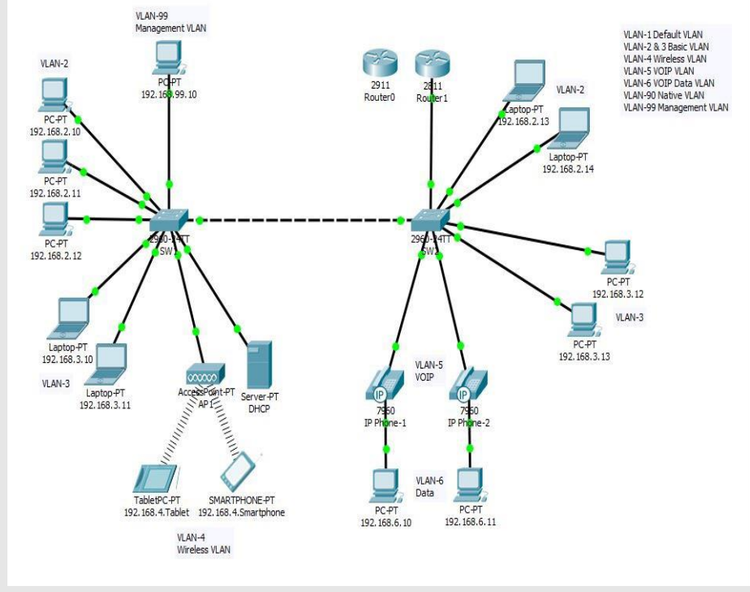

Figure 3 – Finished Product

Results & Conclusion

This project that titled as “Design and Implementation of a Virtual Local Area Network with using Cisco Operating System”. In this project, we have aimed to design VLAN that make easy to create and administration of logical groups which can communicate among themselves. VLAN as Logically Defined Networks. We plan to use VLAN technology, logical networks are created on the devices that support this technology. A VLAN is a switched network that is logically segmented, by functions, project teams, or applications rather than on a physical or geographical basis. Cisco IOS (Internetworking Operating Systems) and Packet Tracer Simulation program will be used to coding the switches and network design in this. One of the most important advantage of that if you want to reconfigure the devices, you do not need to unplug the devices and carry them. Instead of all this, we can use VLANs to reconfigure. This technology(VLAN) allows the reduce CPU overhead on devices by reducing the number of devices reduce security risks by reducing the copies of frames sent and receive unnecessarily.Also another security advantage is VLANs. This project creates opportunities such as flexible, efficient cost, more secure,minimize traffic etc.

Acknowledgement

At first we offer our thanks to Sibel Tarıyan ÖZYER, our consultant. We thank all our teachers who helped us with the feedback. We give thanks to everyone who contributes to the work. The help we received from them was a great asset to improve this project and ourselves.