

Implementation of VLAN Segmentation, EtherChannel, DHCP, and NAT in a Cisco Enterprise Network

Project Documentation

Introduction

This project demonstrates the design and implementation of a Cisco enterprise network using routers and IOSvL2 switches in GNS3.

Objectives

Configure VLAN 150 and VLAN 200, implement EtherChannel using LACP, configure DHCP services, implement NAT, and verify end-to-end connectivity.

Network Topology

The topology consists of two routers (R1 and R2), three IOSvL2 switches (S1, S2, S3), NAT cloud connections, and two PCs located in different VLANs.

VLAN Configuration

VLAN 150 serves PC1 through R1 with gateway 192.168.150.1. VLAN 200 serves PC2 through R2 with gateway 192.168.200.1.

EtherChannel Configuration

LACP EtherChannel links were configured between S1-S2 (Po1) and S1-S3 (Po2). Trunking with VLANs 150 and 200 was enabled across the Port-Channels.

DHCP Configuration

R1 provides DHCP services for VLAN 150 and R2 provides DHCP services for VLAN 200.

NAT Configuration

PAT/NAT overload was configured on both routers to provide Internet access through their WAN interfaces.

Testing and Verification

Verification commands included show vlan brief, show etherchannel summary, show ip interface brief, DHCP lease verification, and ping tests.

Conclusion

The project successfully demonstrates enterprise network segmentation, redundancy using EtherChannel, automatic addressing through DHCP, and Internet connectivity through NAT.