CS2403 COMPUTER NETWORKS

Mini Project Report

Design and simulation of hospital management system

Submitted

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CERTIFICATE

Certified that the CS2403 Computer Networks Mini Project work titled Design and simulation of hospital management system is carried out by Chandana.M(1RUA24CSE0098), Chinmayee.N.V(1RUA24CSE0109), D.Hansika (1RUA24CSE0111), Danyatha.Y.K(1RUA24CSE0114) who are bonafide students of the School of Computer Science and Engineering, RV University, Bengaluru, during the year 2025–26. It is certified that all corrections/ suggestions from all the continuous internal evaluations have been incorporated into the project and in this report.

Dr./ Prof. Sonam V Maju

Faculty Guide

Program Director

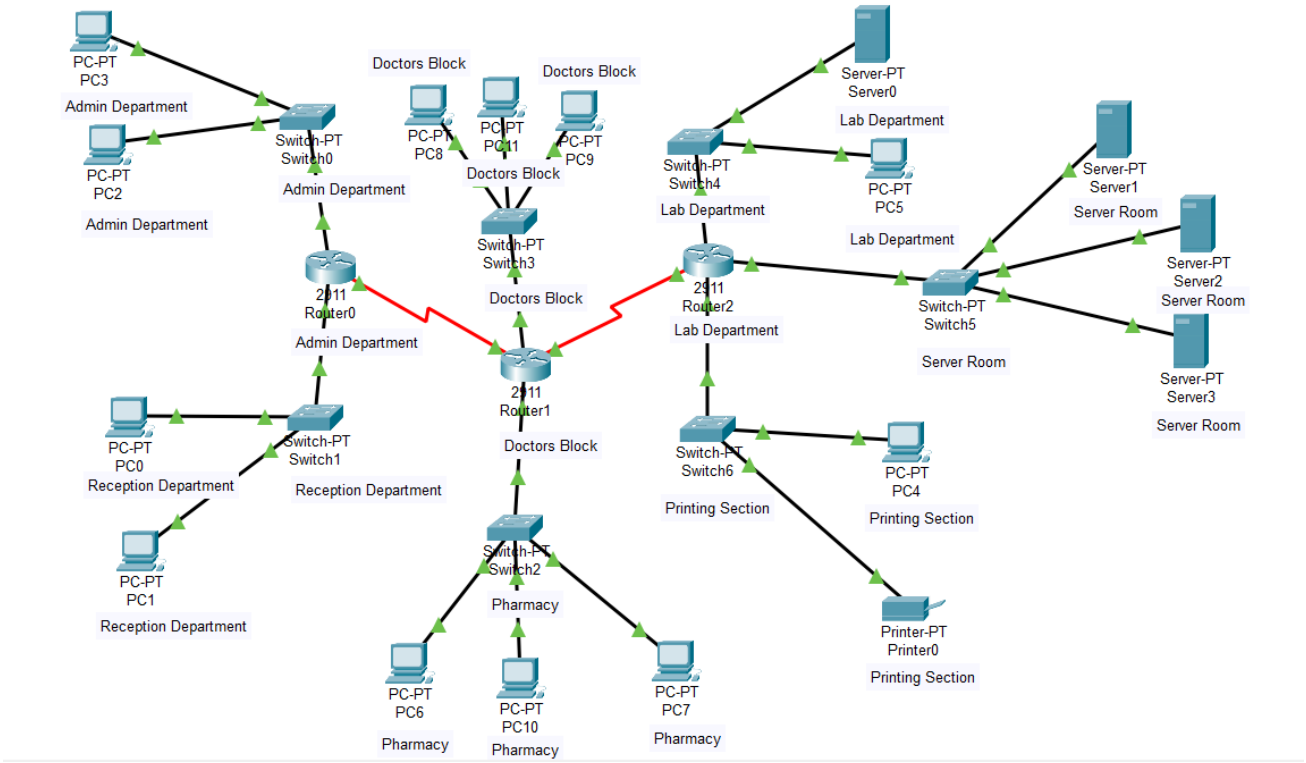
1 Problem statement

Melbourne Health Services faces performance delays, limited control, and security risks due to third-party IT reliance. To overcome these issues, a cost-effective enterprise network is needed using LAN and WAN technologies with core routers, centralized servers, and departmental segmentation. The solution must ensure data confidentiality, integrity, and availability (CIA) through ACLs and secure VPN access, improving communication, efficiency, and data security across both hospital locations.

2. Introduction

This project simulates a hospital network that ensures continuous, secure, and reliable data flow for patient care. The network is divided into Clinical, Administrative, Server, and Guest VLANs for better security and management. Routers and switches handle routing and connectivity, while ACLs protect sensitive data. The setup demonstrates how proper network design supports efficient healthcare operations.

3. Network Diagram



4. Configuration setup

A. **Assign IP Addresses**

- Each PC, Server, and Printer gets an IP from its LAN.
- Router interfaces get corresponding gateway IPs.
- Serial links between routers have different network IPs.

B. **Router Configuration**

- Use no shutdown on all active interfaces.
- Configure serial interfaces with clock rate 64000 (on DCE side).
- Apply routing:

Either Static Routing
ip route [destination network] [mask] [next hop IP]
or Dynamic Routing (e.g., RIP)

C. **Switch Configuration**

- Connect PCs and servers to switches.
- Use switchport mode access for access ports.
- (Optional) assign IP to VLAN 1 for management.

D. **End Device Configuration**

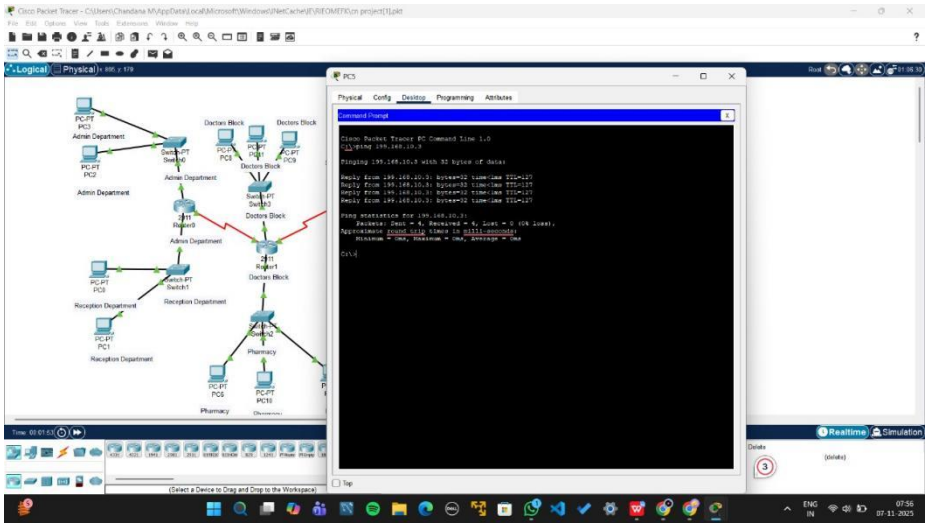
- Configure IP, subnet mask, and default gateway (router's LAN IP).
- Servers and printer also need default gateway.

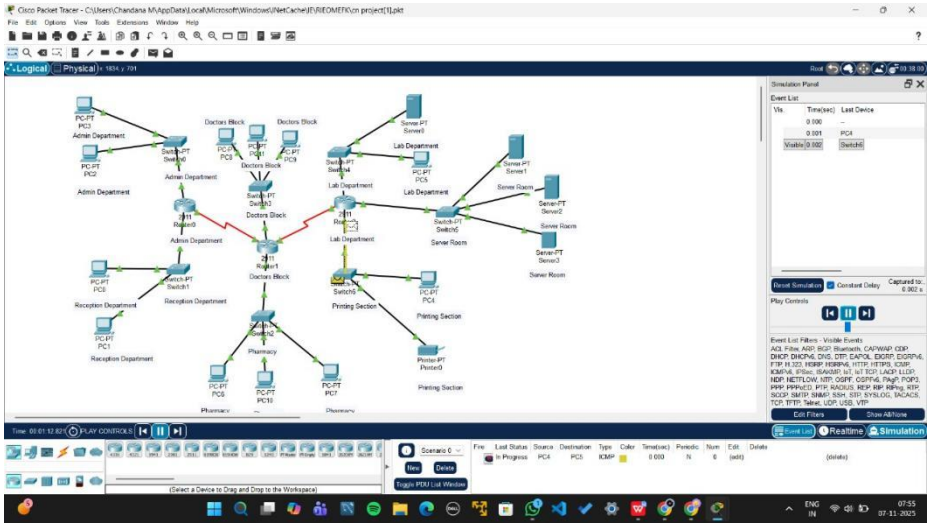
E. **Testing**

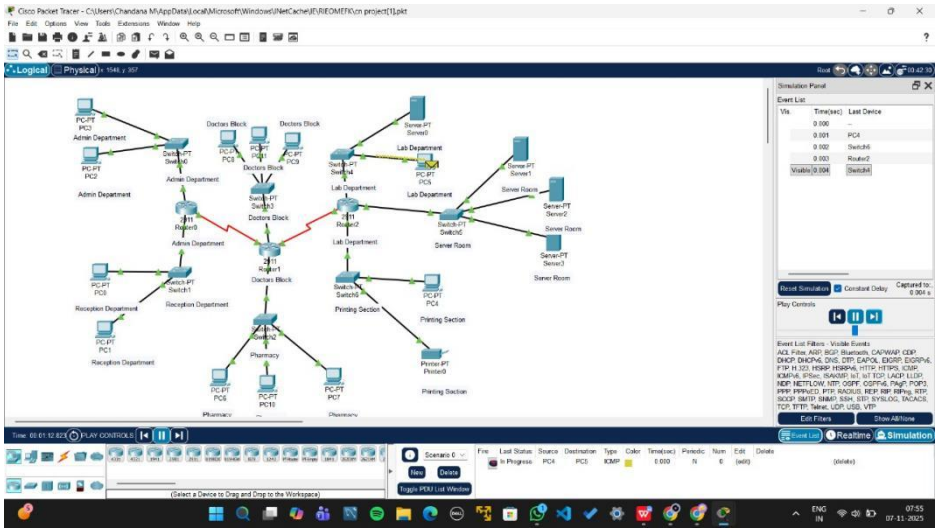
Use ping from any PC to:

- Its own gateway
- A PC in another network
- Servers and printer
- If all succeed → full connectivity achieved

5. Results







6. Conclusion

In this project, we designed and simulated a hospital management network using Cisco Packet Tracer to demonstrate the segmentation of clinical, administrative, and guest traffic. The network supports inter-VLAN routing, server hosting for EHR and PACS systems, and basic access control to protect sensitive resources. Connectivity was validated using ICMP and HTTP tests, showing how redundancy and access policies enhance reliability and security. Future improvements can include dynamic routing (OSPF), stronger authentication with RADIUS, encrypted remote access using IPsec VPNs, and QoS policies to prioritize critical medical data and real-time communications.