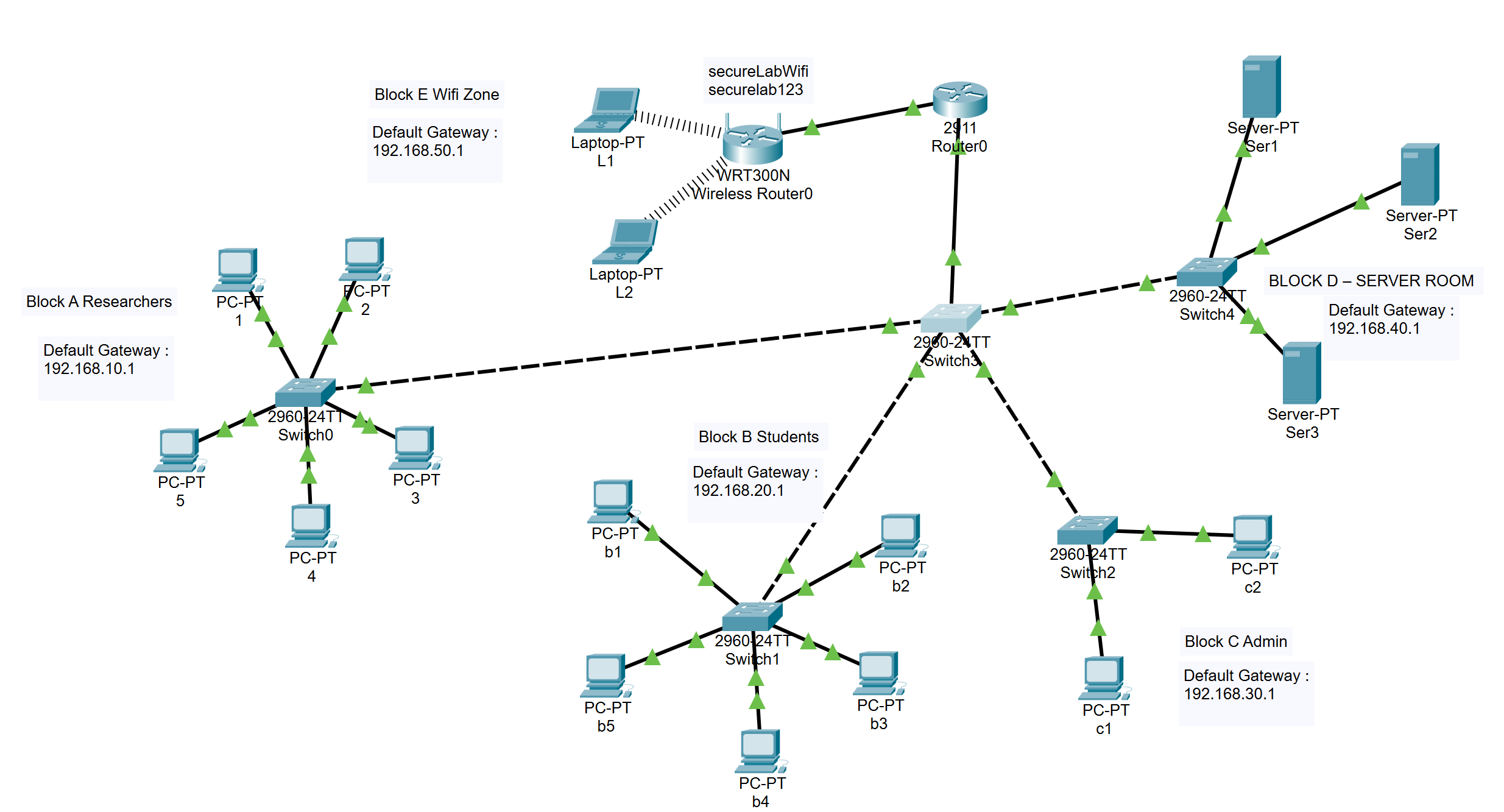
Final Project Report: Secure Research Lab Infrastructure

# 1. Objective

The objective of this project is to design and implement a secure, segmented research lab network with strict access control for researchers, students, administrators, and server infrastructure. The project showcases the coexistence of multiple routing protocols , VLAN segmentation, firewall protection, and wireless security.

# 2. Network Design Summary

The network is divided into five logical blocks with separate VLANs and IP addressing schemes:  
- Block A: Researchers (VLAN 10, IP-MAC Binding)  
- Block B: Students (VLAN 20, Rate Limiting)  
- Block C: Admin (VLAN 30, SSH-Only Access)  
- Block D: Server Room (VLAN 40, Firewall + DMZ)  
- Block E: Wi-Fi Zone (VLAN 50, WPA2-AES Encryption)

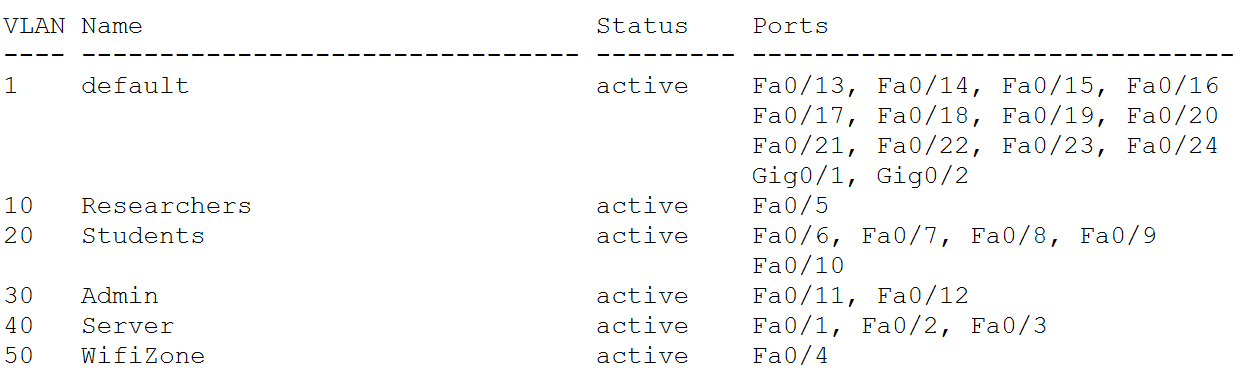


# 3. Device Inventory

- PCs: 12  
- Laptops: 2  
- Servers: 3  
- Switches: 5 (4 Access, 1 Distribution)  
- Router: 1 (Cisco 2911)  
- Wireless Router: 1 (WRT300N)

# 4. IP Addressing & VLANs

- VLAN 10 (Researchers): 192.168.10.0/24, Gateway: 192.168.10.1  
- VLAN 20 (Students): 192.168.20.0/24, Gateway: 192.168.20.1  
- VLAN 30 (Admin): 192.168.30.0/24, Gateway: 192.168.30.1  
- VLAN 40 (Server Room): 192.168.40.0/24, Gateway: 192.168.40.1  
- VLAN 50 (Wi-Fi Zone): 192.168.50.0/24, Gateway: 192.168.50.1



# 5. Router Configuration (Router-on-a-Stick)

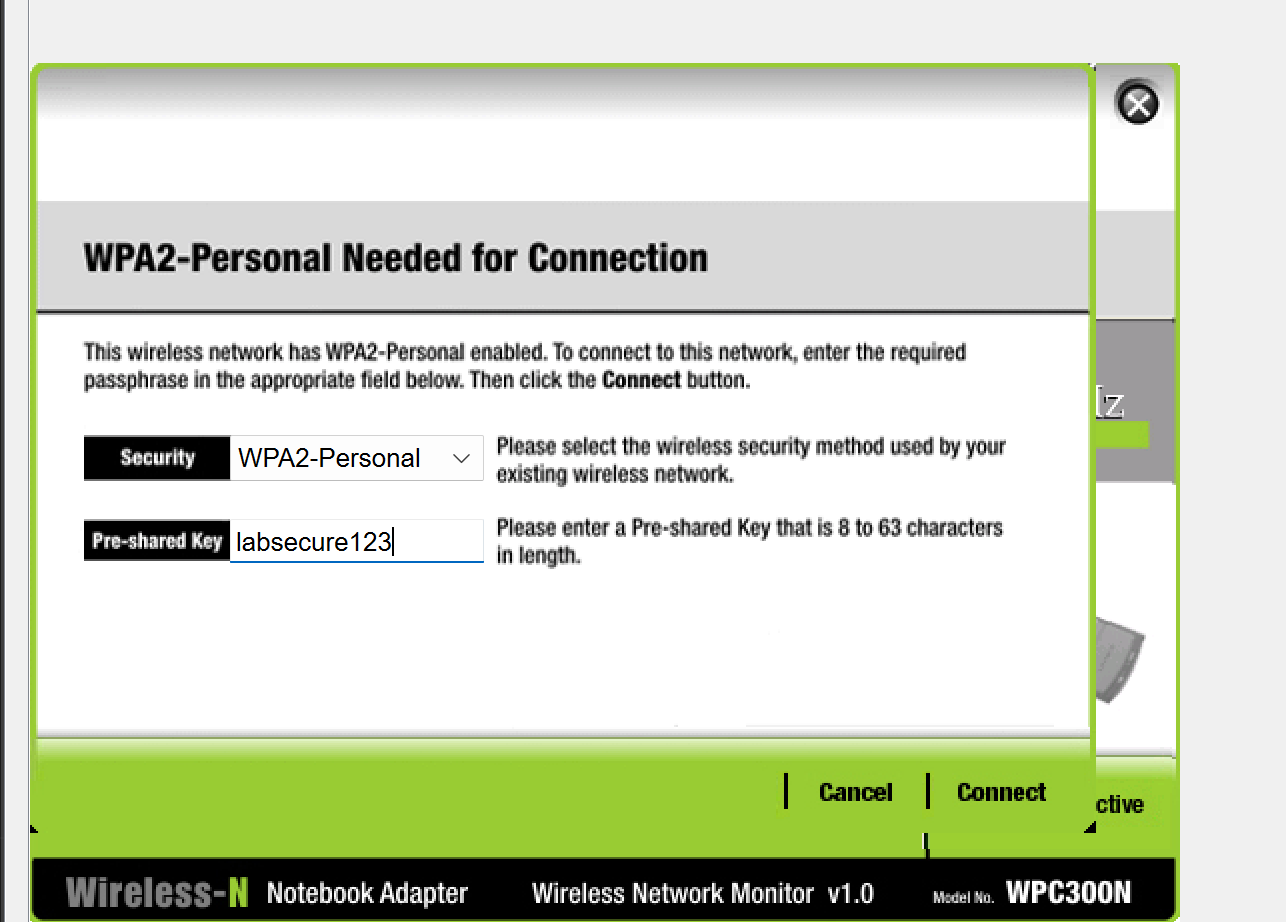
Sub-interfaces for VLAN routing were created on interface g0/0:  
- g0/0.10 -> VLAN 10  
- g0/0.20 -> VLAN 20  
- g0/0.30 -> VLAN 30  
- g0/0.40 -> VLAN 40  
- g0/0.50 -> VLAN 50

# 6. Switch Configuration Summary

- Switch0: Access for VLAN 10 (Researchers)  
- Switch1: Access for VLAN 20 (Students), with port rate limiting  
- Switch2: Access for VLAN 30 (Admin)  
- Switch4: Access for VLAN 40 (Servers)  
- Switch3 (Core): Trunk connections to all other switches

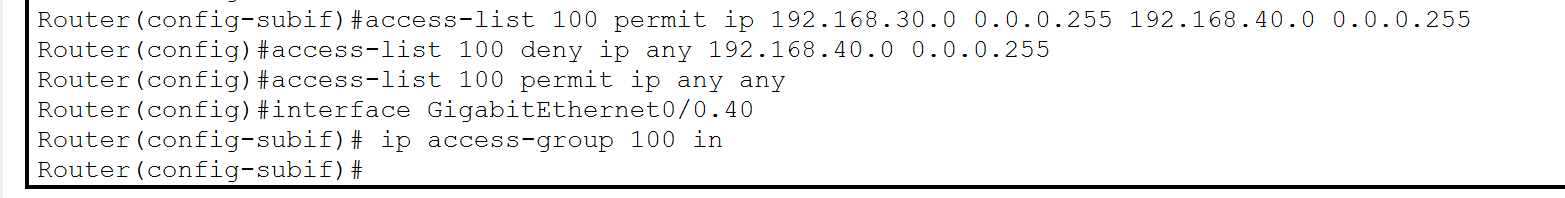
# 7. Wi-Fi Zone Configuration

- Device: WRT300N Wireless Router  
- SSID: LabWiFi Password : labsecure123  
- Security: WPA2 with AES encryption  
- IP Range: 192.168.50.0/24  
- Connected to Switch3 via Fa0/4 (access port on VLAN 50)



# 8. Security Protocol Summary

- Researchers: IP-MAC Binding  
- Students: VLAN Segmentation + Rate Limiting  
- Admins: SSH-Only Access  
- Servers: DMZ with Firewall  
- Wi-Fi: WPA2-AES Authentication



# 9. Final Notes

All configurations were implemented in Cisco Packet Tracer with appropriate logical topology, IP addressing, VLAN configuration, router setup, and security protocols. The network ensures inter-VLAN routing, secure wireless access, and proper segmentation of users.