# Smart Office Network Design

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# Objectives & Scope

**Objective**: Build a secure, scalable network for 50 users + Wi-Fi + servers + printers

**Outcomes**: Device selection, IP addressing, error control, protocol choices

# Requirements & Constraints

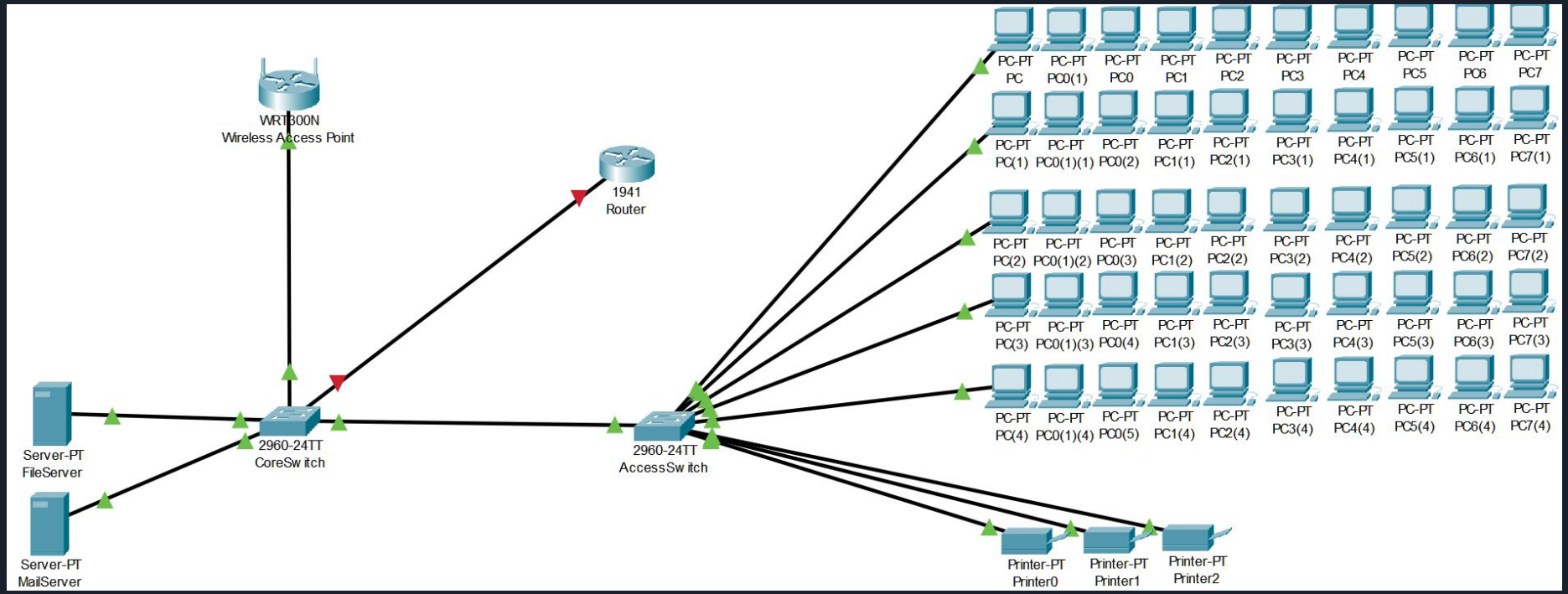
50 wired PCs, Wi-Fi devices (guests & staff)

3 network printers

2 servers (file + e-mail)

High availability & basic security

# Network Topology Diagram



# Network Devices & Justification

**Router**: Cisco 1941 for inter-VLAN routing & DHCP

**Core Switch**: Cisco 2960 (Layer 2 switching, VLAN support)

**Access Switch**: Cisco 2960 for user ports

**WAP**: WRT300N for WPA2 wireless

**Servers**: Packet Tracer “Server” (virtual) running File & DHCP services

**Printers**: Standard network printers, static IPs

# IP Addressing Scheme

192.168.10.0/26 → Employees
192.168.10.64/26 → Guests
192.168.10.128/29 → Printers
192.168.10.136/30 → Servers

# Error Detection & Correction

Ethernet FCS (CRC) at Layer 2: detects frame-level corruption

TCP Checksums & ACK/ARQ at Layer 4: retransmissions of lost/corrupted segments

Example: if a bit flips in transit, CRC catches it, frame is dropped, TCP re-sends

# Protocol Recommendations & Summary

File Transfer: SFTP (encrypted, integrity-checked)

Email: SMTP w/ TLS for sending; IMAP w/ SSL for retrieval

Conclusion: This design meets capacity, security, and manageability needs

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