**📡 Enterprise Network Infrastructure Design and Implementation for Trading Floor Support Centre**

**Project Overview**

As part of the organization’s expansion, the Trading Floor Support Centre — employing over **600 staff** — is relocating to a new three-floor facility. The new building is currently without any network infrastructure. To support business continuity and future scalability, a **robust, secure, and scalable network solution** is required. This project focuses on the **logical network design and configuration** using **Cisco Packet Tracer** based on a **hierarchical architecture**, ensuring redundancy, high availability, and efficient communication across all departments.

**Project Objectives**

The primary goal of this project is to design and implement a full network solution for the new building that will:

* Support **600+ users** across **seven departments** and a **server room**
* Provide **redundant connections** to **two ISPs** using dual routers
* Implement **VLAN segmentation**, **inter-VLAN routing**, and **wireless connectivity**
* Ensure **security**, **dynamic IP addressing**, **remote access**, and **traffic control**
* Be **scalable and future-proof** to accommodate future growth and changes

**Key Network Design Elements**

**1. Hierarchical Network Topology**

* **Core Layer**: Two routers connected redundantly to **two ISPs** using **public IPs** (195.136.17.0/30, 195.136.17.4/30, 195.136.17.8/30, 195.136.17.12/30)
* **Distribution Layer**: Dual **Layer 3 Multilayer Switches** for redundancy and routing
* **Access Layer**: Departmental switches on each floor, each connected to the multilayer switches

**2. Departmental Allocation and VLANs**

* Each department is mapped to a **separate VLAN and subnet**
* IP subnetting derived from **172.16.1.0/16** base address
* Wireless Access Points for each department integrated into their VLANs

**3. IP Address Management**

* All end devices receive IP addresses **dynamically** via **DHCP servers** located in the Server Room
* Server Room devices are **manually assigned static IPs**
* PAT configured to allow private-to-public address translation

**4. Routing & Communication**

* **OSPF** configured across **routers and multilayer switches** to ensure dynamic route advertisement
* **Inter-VLAN routing** enabled via multilayer switches
* **ACLs implemented** to restrict or permit specific traffic across VLANs

**5. Security Features**

* **SSH access** enabled on all routers and multilayer switches for secure remote login
* **Port-security** on Finance & Accounts department switchports:
  + Limited to one device per port
  + Sticky MAC address learning
  + Violation mode: Shutdown

**6. Device Configuration**

* All network devices configured with:
  + Hostnames
  + Console and enable passwords
  + Login banners
  + IP domain lookup disabled

**Expected Outcomes**

* Fully functional and secure enterprise-grade network
* Seamless communication across all departments
* Redundant ISP connectivity for high availability
* Scalable design ready for future enhancements
* Secure administrative access and controlled device connectivity