5COM1055, Operating Systems and Networks

Project Title: **Network Configuration and Full Connectivity**

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1. **Project Aims:**

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Description automatically generated with medium confidenceMy objective was to design and implement network configuration for LAN’s in both London and Manchester offices. This includes creating IP addressing scheme, configuring routers and PC’s, ensuring full connectivity between devices and incorporating wireless network.

I have implemented a network infrastructure comprising two LAN networks interconnected by a WAN link between London and Manchester. The London area network comprises a total of eight PCs, three switches, one Access Point and one Router, with a associated cost of 13,500. In the Manchester area, there are four PCs, three switches and one Router, with a network cost amounting to 9,485. The combined cost of the entire network deployment is 22,985. The interconnection between the London and Manchester Routers is established through a Serial DTE wire, while the remaining connections utilize Copper Straight-Through wiring. This setup ensures efficient communication and collaboration between the two locations, meeting the organization's connectivity requirements effectively.

1. **Addressing Scheme and Device Connection Documentation:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Device Name | Interface | IP address | Subnet Mask | Default Gateway | Network Address |
| R-London | Gig0/0 | 192.168.0.1 | 255.255.0.0 |  | 10.0.0.0 |
| Se0/1/0 | 11.0.0.1 | 255.0.0.0 |  | 11.0.0.0 |
| LAdmin 1 | NIC | 192.168.0.2 | 255.255.0.0 | 192.168.0.1 |  |
| LAdmin 2 | NIC | 192.168.0.3 | 255.255.0.0 | 192.168.0.1 |  |
| LAdmin 3 | NIC | 192.168.0.6 | 255.255.0.0 | 192.168.0.1 |  |
| L-Lawyer 1 | NIC | 192.168.0.7 | 255.255.0.0 | 192.168.0.1 |  |
| L-Lawyer 2 | NIC | 192.168.0.8 | 255.255.0.0 | 192.168.0.1 |  |
| L-Lawyer 3 | NIC | 192.168.0.9 | 255.255.0.0 | 192.168.0.1 |  |
| Wireless PC 1 | NIC | 192.168.0.4 | 255.255.0.0 | 192.168.0.1 |  |
| Wireless PC 2 | NIC | 192.168.0.5 | 255.255.0.0 | 192.168.0.1 |  |
| R-Manchester | Gig0/0 | 172.16.0.1 | 255.255.0.0 |  | 172.16.0.0 |
| Se0/0/0 | 11.0.0.2 | 255.0.0.0 |  | 11.0.0.0 |
| MAdmin 1 | NIC | 172.16.0.2 | 255.255.0.0 | 172.16.0.1 |  |
| MAdmin 2 | NIC | 172.16.0.3 | 255.255.0.0 | 172.16.0.1 |  |
| M-Lawyer 1 | NIC | 172.16.0.4 | 255.255.0.0 | 172.16.0.1 |  |
| M-Lawyer 2 | NIC | 172.16.0.5 | 255.255.0.0 | 172.16.0.1 |  |

1. **Components Details:**

**SWITCH**

I have used the 2960 switch in my network as it offers unparalleled performance, reliability, and scalability, ensuring seamless data transfer and accommodating the evolving needs of our network infrastructure with its advanced features and robust design. In my network I have used switch to set up the LAN connection in London and Manchester respectively.

**CONNECTIONS**

In my network I have used a Copper Straight – Through wire for connecting devices that require the same wiring scheme on both ends i.e. PCs to switches or switches to routers. The reason behind using a copper straight-through wire is that it maintains the same pin configuration at both ends of the cable. This consistency ensures that the transmit pins of one end align with the receive pins of the other end, facilitating proper communication between the devices. Also I have used Serial DTE wire for connection between the routers for establishing the WAN(Wide Area Network) due to their reliability and stability over long distances.

**ROUTER**

I have used a 2911 Router in this network as it provides exceptional performance, versatility in connectivity options, advanced security features, modular design for scalability, and unmatched reliability, ensuring seamless and efficient network operations. I have added HWIC-1GE-SFP which is a single-wide HWIC with one Small Form-Factor Pluggable (SFP) slot. The SFP slot is populated with Cisco copper and optical Gigabit Ethernet SFPs which provides 1-port Gigabit Ethernet connectivity and also added HWIC-2T which is a Cisco 2-Port Serial High-Speed WAN Interface Card, providing 2 serial ports.

The Configure Privileged EXEC, unencrypted password – **cisco**

The Configure Privileged EXEC, encrypted password - **cla**A screenshot of a computer program

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Manchester Router Configuration

London Router Configuration

**ACCESS POINT**

I have used Access Point-PT in my network because it offers a dedicated platform for simulating and understanding wireless networking configurations, allowing me to focus specifically on wireless networking components such as access points, SSIDs, and security protocols.

For security reasons I have added a WEP key - 1234567890