Network Topology
For Software House

for

Computer Networks Lab
CL307

Contents

Abstract This report describes the network design of software house. A network topology is the pattern in which nodes (i.e., computers, printers, routers or other devices) are connected to a local area network (LAN) or other network via links (e.g., twisted pair copper wire cable or optical fiber cable). We have used Cisco Packet Tracer 7.2.1 for designig the network topology of software house.

1 Network Requirements

In software house, we have desktops, laptops, smart phones and other IoTs which require a reliable internet connection for 12 hours a day. There will be a data flow between the devices within the system and also outside the system. We have divided our network into segments 3 floors and on each floor there are multiple departments for which there are multiple labs. We have build layers of security for confidentiality of data routers can only be accessed by IT managers using SSH. In short, network requirements include network devices like routers, switches, network security and instant response plan.

1.1 IP Address Distribution

1. 2nd Floor
    - Server Room: 165.124.0.0 255.255.255.224
    - CEO Office: 165.124.0.113 255.255.255.240
    - Java Lab1 165.124.0.129 255.255.255.240
    - Java Lab2 165.124.0.145 255.255.255.240
    - Android Lab1 165.124.0.161 255.255.255.240
    - Android Lab2 165.124.0.177 255.255.255.240
    - Web Design Lab1 165.124.0.209 255.255.255.240
    - Web Design Lab2 165.124.0.225 255.255.255.240
    - Cyber Security Lab 165.124.0.241 255.255.255.240

2. 1st Floor
    - Database Lab1 165.124.1.97 255.255.255.240
    - Database Lab2 165.124.1.113 255.255.255.240
    - Data Science Lab 165.124.1.129 255.255.255.240
    - Data Analytics Lab 165.124.1.49 255.255.255.240
    - Computer Vision Lab 165.124.1.65 255.255.255.240
    - Game Development Lab 165.124.1.81 255.255.255.240
    - ML Research Lab 165.124.1.1 255.255.255.240
    - AI Research Lab 165.124.1.17 255.255.255.240
    - AR and VR Lab 165.124.1.33 255.255.255.240
    - IT Manager and Public Wifi 165.124.0.33 255.255.255.224
3. Ground Floor
    - IT Manager GF 165.124.0.65 255.255.255.224
    - Web Dev Inspection 165.124.1.145 255.255.255.240
    - Web Dev Testing Lab 165.124.1.161 255.255.255.240
    - Building Security 165.124.1.177 255.255.255.240
    - App Dev Inspection 165.124.1.193 255.255.255.240
    - App Dev Testing 165.124.1.209 255.255.255.240
    - HR Management 165.124.1.225 255.255.255.240
    - Accounting and Finance 165.124.1.241 255.255.255.240
    - Marketing 165.124.2.1 255.255.255.240
    - Logistics 165.124.2.17 255.255.255.240

1.2 Technologies Used

- DHCP
- FTP
- DNS
- HTTP
- SSH
- SMTP
- Wifi

- RIP Version 2
- VLSM

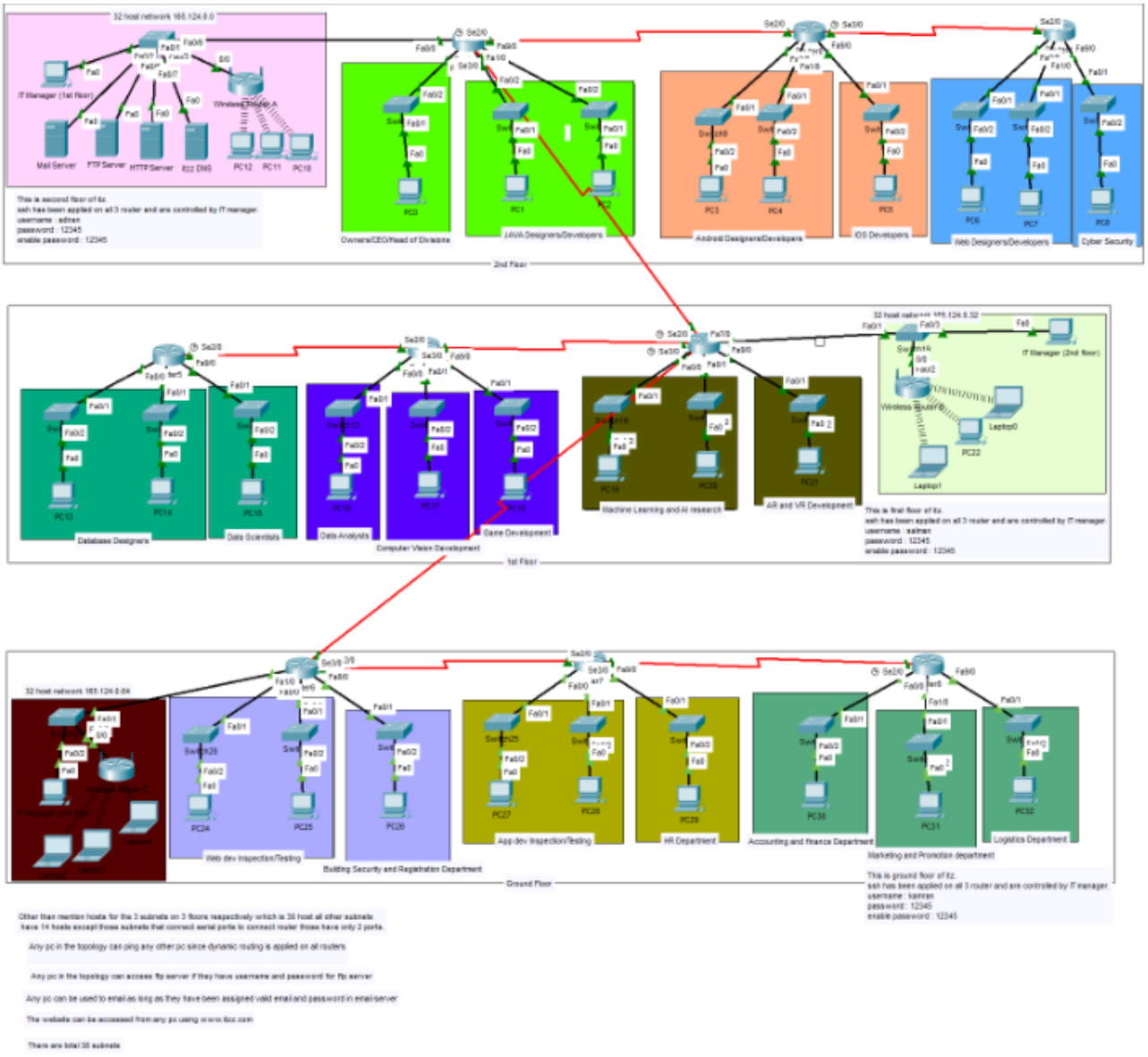

Figure 1.1: Topology

2 Network Topology Diagram Explanation

We have divided the topology in 38 subnets in which 27 subnet are for labs (one for each lab) then 3 subnets for wifi (one on each floor) and 8 subnets to keep router connected with each other. There are 20 departments in this software house in which some departments have 2 labs and some have 1 lab. There are 9 labs on each floor and one wireless router on each floor. The main servers providing facilities like HTTP, SMTP etc are all connected to second floor network managing router and the facilities on these servers can be accessed by anyone in the entire building.

2.1 IP network Pool

We have use 1 B class IP which is 165.124.0.0 and we have used subnetting to divide this IP in subnets of 32, 16 and 4 as per requirements. We have used IPs from 165.124.0.0 till 165.124.2.63 which makes up around 576 host divided among 38 subnets. The labs have a subnet of 14 hosts and IT managing has a subnet of 30 hosts and to connect routers subnet of 2 hosts is used.

3 Summary

The network has been designed keeping in view the basic needs and requirements of a software house. It has 3 separate floors and 20 departments, includes the basic networking concepts, like Sub-netting, VLSM, Routing Protocols (RIP v2), DHCP , DNS, FTP and SMTP.