**BANKING NETWORK DESIGN**

ABOUT THE PROJECT:

FCFC Bank. is a US-owned company that deals with Banking and Insurance. The company intends to expand its services across India having the first branch in Coimbatore, Tamil Nadu. The company has secured a four-story building to operate within Coimbatore city. Carefully read down the requirements then model the design and implement the network based on the company's needs. Each floor has departments as provided in the table below.

First Floor

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Departments | No. of PC | No. of Printers |
| 1 | Management | 20 | 4 |
| 2 | Research | 20 | 4 |
| 3 | Human resource | 20 | 4 |

Second Floor

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Departments | No. of PC | No. of Printers |
| 1 | Marketing | 20 | 4 |
| 2 | Accounting | 20 | 4 |
| 3 | Finance | 20 | 4 |

Third Floor

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Departments | No. of PC | No. of Printers |
| 1 | store | 20 | 4 |
| 2 | Customer care | 20 | 4 |
| 3 | Guest | 40 | 2 |

Fourth Floor

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Departments | No. of PC | No. of Printers and Servers |
| 1 | Admin | 20 | 2 |
| 2 | ICT | 20 | 2 |
| 3 | Server Room | 2 | Server 3(DHCP&DNS, email and HTTP) |

**Requirements:**

1. Use a software modeling tool to visualize the network topology (consider the requirement

* Software Modelling Tools: MS Visio, Visual Paradigm, or Draw.io for modeling network design.

2. Use any of the following network simulation software to implement the above topology:

* Simulation software: Cisco Packet tracer or GNS3 for design and implementation.
* There should be one router on each floor. The router should be connecting switches on that floor.
* Use OSPF as the routing protocol to advertise routes.
* Each department is required to have a wireless network for the users.
* Each department except the server room will be anticipated to have around 60 users both wired and wireless users.
* Host devices in the network are required to obtain IPv4 addresses automatically.
* Devices in all the departments are required to communicate with each other.
* All devices in the network are expected to obtain an IP address dynamically from the dedicated DHCP servers located in the server room.
* Create HTTP and E-mail servers
* Configure SSH in all the routers for remote login.

3. Use hierarchical network design with redundancy included:

* Having core, distribution, and access layers.

4. Configure the basic configuration of the devices:

* Hostnames
* Line Console and VTY passwords
* Banner messages
* Disable domain IP lookup

5. Each department should be in a different VLAN

* Create VLANs in every department
* VLANs you will use in your case, including VLAN1 also e.g. 10, 20, 30... etc.
* Each VLAN should be a different subnetwork.

6. Planning of IP Addresses:

* You have been given 192.168.10.0 as the base address for this network.
* Do subnetting based on the number of hosts in every department as provided above.

7. End Device Configurations:

* Identify the subnet mask, useable IP address range, and broadcast address for each subnet.
* Configure all the band devices in the network with the appropriate IP address based on the calculations above.

8. Configure port-security:

* Use the sticky command to obtain the MAC Address.
* Violation mode of the shutdown.

9. Test Communication:

* Do devices in the same VLAN communicate?
* Do the devices in different VLANs communicate?

10. Document the project design and implementation.

**Do list**

1.Draw a diagram of the network and design in the cisco packet tracer

1. Basic settings to all devices, and SSH on the routers and L3 switches. D

2. VLANs assignment and all access and trunk ports.

3. Switchport security to all 12 switches. D

4. Subnetting and IP addressing

5. OSPF on the routers and 15 switches

6. Static IP address to Server Room devices.

7. DHCP server device configuratiuons.

8. Inter-VLAN routing on the 13 switches, and IP DHCP helper addresses.

9. Wireless network configurations.

10. Verifying and testing configurations.

**IP Addressing**

**Base address: 192.168.10.0**

**First Floor**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Department | Network Address | Subnet Mask | Host Address Range | Broadcast Address |
| Management | 192.168.10.0 | 255.255.255.192/26 | 192.168.10.1 to  192.168.10.62 | 192.168.10.63 |
| Research | 192.168.10.64 | 255.255.255.192/26 | 192.168.10.65 to  192.168.10.126 | 192.168.10.127 |
| Human Resource | 192.168.10.128 | 255.255.255.192/26 | 192.168.10.129 to  192.168.10.190 | 192.168.10.191 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Department | Network Address | Subnet Mask | Host Address Range | Broadcast Address |
| Marketing | 192.168.10.192 | 255.255.255.192/26 | 192.168.10.193 to  192.168.10.254 | 192.168.10.255 |
| Accounts | 192.168.11.0 | 255.255.255.192/26 | 192.168.11.1 to  192.168.11.62 | 192.168.11.63 |
| Finance | 192.168.11.64 | 255.255.255.192/26 | 192.168.11.65 to  192.168.11.126 | 192.168.11.127 |

**Second Floor**

**Third Floor**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Department | Network Address | Subnet Mask | Host Address Range | Broadcast Address |
| Logistics | 192.168.11.128 | 255.255.255.192/26 | 192.168.11.129 to  192.168.11.190 | 192.168.11.191 |
| Customer | 192.168.11.192 | 255.255.255.192/26 | 192.168.11.193 to  192.168.11.254 | 192.168.11.255 |
| Guest | 192.168.12.0 | 255.255.255.192/26 | 192.168.12.1 to  192.168.12.62 | 192.168.12.63 |

**Fourth Floor**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Department | Network Address | Subnet Mask | Host Address Range | Broadcast Address |
| Admin | 192.168.12.64 | 255.255.255.192/26 | 192.168.12.65 to  192.168.12.126 | 192.168.12.127 |
| ITC | 192.168.12.128 | 255.255.255.192/26 | 192.168.12.129 to  192.168.12.190 | 192.168.12.191 |
| Server Room | 192.168.12.192 | 255.255.255.192/26 | 192.168.12.193 to  192.168.12.254 | 192.168.12.255 |

**Between the Routers and Layer-3 Switches**

**Base Network Address: 10.10.10.0**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Network Address | Subnet Mask | Host Address Range | Broadcast Address |
| 1. | 10.10.10.0 | 255.255.255.252 | 10.10.10.1 to  10.10.10.2 | 10.10.10.3 |
| 2. | 10.10.10.4 | 255.255.255.252 | 10.10.10.5 to  10.10.10.6 | 10.10.10.7 |
| 3. | 10.10.10.8 | 255.255.255.252 | 10.10.10.9 to  10.10.10.10 | 10.10.10.11 |
| 4. | 10.10.10.12 | 255.255.255.252 | 10.10.10.13 to  10.10.10.14 | 10.10.10.15 |
| 5. | 10.10.10.16 | 255.255.255.252 | 10.10.10.17 to  10.10.10.18 | 10.10.10.19 |
| 6. | 10.10.10.20 | 255.255.255.252 | 10.10.10.21 to  10.10.10.22 | 10.10.10.23 |
| 7. | 10.10.10.24 | 255.255.255.252 | 10.10.10.25 to  10.10.10.26 | 10.10.10.27 |
| 8. | 10.10.10.28 | 255.255.255.252 | 10.10.10.29 to  10.10.10.30 | 10.10.10.31 |
| 9. | 10.10.10.32 | 255.255.255.252 | 10.10.10.33 to  10.10.10.34 | 10.10.10.35 |
| 10. | 10.10.10.36 | 255.255.255.252 | 10.10.10.37 to  10.10.10.38 | 10.10.10.39 |
| 11. | 10.10.10.40 | 255.255.255.252 | 10.10.10.41 to  10.10.10.42 | 10.10.10.43 |
| 12. | 10.10.10.44 | 255.255.255.252 | 10.10.10.45 to  10.10.10.46 | 10.10.10.47 |
| 13. | 10.10.10.48 | 255.255.255.252 | 10.10.10.49 to  10.10.10.50 | 10.10.10.51 |
| 14. | 10.10.10.52 | 255.255.255.252 | 10.10.10.53 to  10.10.10.54 | 10.10.10.55 |