**Mini Project 1: Basic Networking, Subnetting and Switching Case Study**

As a junior network engineer, you have been hired by XYZ Company to design and implement the company network. The company is a medium-sized company that is specialized in Banking and Insurance having three-Storey building. Each floor has department as provided in the table below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **First Floor** | | | | |
| **No.** | **Department** | **No. of PC** | **No. of Printers** | **No. of Servers** |
| 1 | ICT | 20 | 4 | 2 |
| 2 | Research | 20 | 4 | 1 |
| 3 | Electrical | 10 | 2 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Second Floor** | | | | |
| **No.** | **Department** | **No. of PC** | **No. of Printers** | **No. of Servers** |
| 1 | Marketing | 10 | 2 | 1 |
| 2 | Accounting | 10 | 2 | 1 |
| 3 | Finance | 10 | 2 | 1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Third Floor** | | | | |
| **No.** | **Department** | **No. of PC** | **No. of Printers** | **No. of Servers** |
| 1 | Logistics and Store | 10 | 2 | 1 |
| 2 | Customer Care | 10 | 4 | 1 |

**Requirements**

1. Use a Software Modelling tools to visualize the network topology ( Consider requirement 3) Software tools to be used

* Software modelling Tools e.g. MS Visio, Visual Paradigm or Draw.io for modelling network design

1. Use any of the following simulation software to implement the above topology

* Simulation Software e.g. Cisco Packet Tracer, GNS3 for Design and implementation

1. Use Hierarchical Network Design

* Having Core, Distribution and Core Layer
* Make sure to have redundancy

Note: At this level Only Configure Access Layer Switches and End Device

1. Configure the basic configuration to the device.

* Hostnames
* Line Console and VTY passwords
* Banner Message
* Disable domain IP Lookup
* Exec Timeout (3 min 0 Sec) and Logging Synchronous

1. Each Department should in different VLAN

* Use VTP to create VLANs at every Department
* Use VTP pruning to allow only VLANs you will use in your case, include VLAN 1 also e.g. 1,10, 20, 30…. Etc.
* Each VLAN should be a different subnetwork

1. Configure Ether Chanel Between switches

* Use Standard Protocol LACP

1. Planning of IP Addresses

* You have been given 192.168.100.0/24 as the base address of this network
* Do Subnetting based on the number of hosts in every department as provided above.
* Identify Subnet Mask, usable IP address range and broadcast address for each subnet.

1. End Device Configuration

* Configure all the end devices in network with appropriate IP address bases on the calculation above.

1. Configure Port Security

* Use sticky command to obtain MAC address.
* Violation mode of the Shutdown

1. Test Communication

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

1. Document the project design and Implementation.