

Project 5- Bank Network Design & implementation

Radeon company Ltd, is a US-owned company that deals with Baking and Insurance. The company is intending to expand its services across the Africa continent having **the first branch** to be in Nairobi, Kenya. The company has secured **a four-story building** to operate within the Kenyan capital city. Each floor has departments as provided in the following tables:

1 st Floor			
No	Department	No of PC	No of printers
1	Management	20	4
2	Research	20	4
3	HR	20	4
2 nd Floor			
1	Marketing	20	4
2	Accounting	20	4
3	Finance	20	4
3 rd Floor			
1	Logistics & Store	20	4
2	Customer Care	20	4
3	Guest Area	40	2
4 th Floor			
1	Admin	20	2
2	ICT	20	2
3	Server	2 Admin PC	3 Servers*

* Servers for DHCP, HTTP and Email

Requirements:

- Connection between devices on each floor
 - There should be **one Router-Switch connection** on each floor.
 - Use **OSPF as routing protocol** to give connectivity among routers.
 - Each department** requires to have a **wireless network**.
 - Each department**, except the server room, **should have around 60 users** both wired and wireless connections.
 - Host devices in each network are required to obtain **IPv4 automatically and dynamically** from the **dedicated DHCP server** located at the server room.
 - Devices in **all the departments should be communicated** with each other.
 - Create **HTTP and Email servers**.
 - Configure **SSH in all the routers** for remote login
- Use Hierarchical network** design with redundancy included:
 - Having **Core, Distribution and Access Layer**
- Configure the basics of the devices
 - Hostnames
 - Line Console and VTY Pass
 - Banner messages

- d. Disable domain IP lookup
- 4. **VLANs** departments
 - a. Create a VLAN in every department.
- 5. **Planning of IP** addresses
 - a. You've **given 192.168.10.0 as the base address** of the entire network
 - b. Manage the IPs doing subnetting based on the number of hosts in every department as provided above.
- 6. End devices configurations
 - a. Configure all the end devices in the network with the appropriate IP address based on the subnetting done.
- 7. Configure **port-security**
 - a. Use **sticky command** to obtain MAC addresses
 - b. **Violation mode** of the shutdown
- 8. Test communication
 - a. Make all necessary test communications.

IP ADDRESSING

Initial Conditions

- **Base Network 192.168.10.0**
- **Server Room** – Static IP in network address 192.168.12.192 /26 with L3-Switch as Default GW
- **Routers and L3 Switches (Point-to-Point)** – Base Network 10.10.10.0

Address allocation

1ST Floor				
Department	Network Address	Subnet Mask	Address Range	Broadcast
Management	192.168.10.0	255.255.255.192 /26	10.1 to 10.62	192.168.10.63
Research	192.168.10.64	255.255.255.192 /26	10.65 to 10.126	192.168.10.127
HR	192.168.10.128	255.255.255.192 /26	10.129 to 10.190	192.168.10.191
2nd Floor				
Marketing	192.168.10.192	255.255.255.192 /26	10.193 to 10.254	192.168.10.255
Accounts	192.168.11.0	255.255.255.192 /26	11.1 to 11.62	192.168.11.63
Finance	192.168.11.64	255.255.255.192 /26	11.65 to 11.126	192.168.11.127
3rd Floor				
Logistics	192.168.11.128	255.255.255.192 /26	11.129 to 11.190	192.168.11.191
Customer	192.168.11.192	255.255.255.192 /26	11.193 to 11.254	192.168.11.255
Guest	192.168.12.0	255.255.255.192 /26	12.1 to 12.62	192.168.12.63
4th Floor				
Admin	192.168.12.64	255.255.255.192 /26	12.65 to 12.126	192.168.12.127
ICT	192.168.12.128	255.255.255.192 /26	12.129 to 12.190	192.168.12.191
Server Room	192.168.12.192	255.255.255.192 /26	12.193 to 12.254	192.168.12.255
4th Floor – Server Room – Static Allocation				
Device	Network	IP Address	Default GW	
DHCP-Server	192.168.12.192 /26	192.168.12.196	192.168.12.193	
EMAIL-Server	192.168.12.192 /26	192.168.12.197	192.168.12.193	
HTTP-Server	192.168.12.192 /26	192.168.12.198	192.168.12.193	

Access & Core Layers				
Nº	Network Address	Subnet Mask	Address Range	Broadcast
1	10.10.10.0	255.255.255.252 /30	10.1 to 10.2	10.10.10.3
2	10.10.10.4	255.255.255.252 /30	10.5 to 10.6	10.10.10.7
3	10.10.10.8	255.255.255.252 /30	10.9 to 10.10	10.10.10.11
4	10.10.10.12	255.255.255.252 /30	10.13 to 10.14	10.10.10.15
5	10.10.10.16	255.255.255.252 /30	10.17 to 10.18	10.10.10.19
6	10.10.10.20	255.255.255.252 /30	10.21 to 10.22	10.10.10.23
7	10.10.10.24	255.255.255.252 /30	10.25 to 10.26	10.10.10.27
8	10.10.10.28	255.255.255.252 /30	10.29 to 10.30	10.10.10.31
9	10.10.10.32	255.255.255.252 /30	10.33 to 10.34	10.10.10.35
10	10.10.10.36	255.255.255.252 /30	10.37 to 10.38	10.10.10.39
11	10.10.10.40	255.255.255.252 /30	10.41 to 10.42	10.10.10.43
12	10.10.10.44	255.255.255.252 /30	10.45 to 10.46	10.10.10.47
13	10.10.10.48	255.255.255.252 /30	10.49 to 10.50	10.10.10.51
14	10.10.10.52	255.255.255.252 /30	10.53 to 10.54	10.10.10.55

Note: To configure DHCP by Server: Service -> DHCP -> Configure: Default GW, and Pools.