ENTERPRISE NETWORK PROJECT##**01** N.Roy-25/03/2024

A trading floor support centre employs 600 staff. They have recently expanded and as a result, need to move to a new building. A building has been identified but has no network. This means that before they can make to move out, new network service needs to be designed and implemented in the new building. Existing Network comprises of the following elements:

The new building is expected to have three floors with two departments in each for example:

1. First floor (Sales and Marketing department-120 users expected, Human Resource and Logistics Department-120 users expected).
2. Seconds floor (Finance and Accounts Department-120 users expected, Administrated and public Relations Department-120 users expected ).
3. Third floor (ICT-120 users expected, Server Room -12 devices expected)

Therefore, as a key member of the Networks Team ,you have been asked to design a network for the new building. At this stage, logical design is required ,which shows the measures that you would put in place to ensure that the new network meets the current business need and is future-proofed.

## Requirements

1. Use Cisco Packet tracer to design and implement the network solution.
2. Use hieratical model providing redundancy at every layer i.e two routers and two multilayers switches are expected to be used to provide redundancy.
3. The network is also expected to connect to at least two ISPs to provide redundancy and each router to the connected to the two ISPs.
4. Each department is required to have a wireless network for the users.
5. Each department should be in a different VLAN and in different sub-network.
6. Provided a base network of 172.16.1.0 , carry out subnetting to allocate the correct number of IP address to each department.

7. The company network is connected to the static, public IP addresses (IP) 195.136.17.0/30, 195.136.17.4/30, 195.136.17.8/30 and 195.136.17.12/30 connected to the two ISPs.
8. Configure basic device settings such as hostname, console password, enable password, banner message, disable IP domain lookup.
9. Devices in all the departments are required to communicate each other with the respective multilayer switch configured for inter-VLAN routing.
10. The Multilayer switches are expected to carry out both routing and switching functionalities thus will be assigned IP addresses.
11. All devices in the network are expected to obtain an IP address dynamically from the dedicated DHCP servers located at the server room.
12. Devices in the server room are to be allocated IP address statically.
13. Use OSPF as the routing protocol to advertise routes both on the routers and multilayer switches.
14. Configure SSH in all the routers and layer three switches for remote login.
15. Configure port-security for the Finance and Accounts department to allow only one device to connect to a switchport, use sticky method to obtain mac-address and violation mode shutdown.
16. Configure PAT to use respective outbound router interface IPv4 address, implement the necessary ACL rule.
17. Test Communication, ensure everything configured is working as expected.

####CONFIG STEPS####

1. Basic settings to all devices plus SSH on the routers an all Switches.
2. VLANs assignment plus all access and trunk ports on L2 and L3 Switches.
3. Switchport security to Finance department.
4. Subnetting and IP addressing properly.
5. OSPF on the routers and L3 switches.
6. Static IP address to ServerRoom devices.
7. DHCP, DNS, Email server device configuration.
8. Inter-VLAN routing on the L3 switches plus IP DHCP helper addresses.
9. Wireless network configuration.
10. PAT and Access Control List.

10.1.1 Default static route.

11. Verifying and testing all configuration.