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**Digital Egypt Pioneers Initiative**

**Project Title**

**Comprehensive network design of a company with two floors or more**

**By**

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**Supervised by**

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**Description**

. This project involves the design and implementation of a secure, resilient network infrastructure for a newly expanded facility housing multiple departments, including Sales, Marketing, HR, IT, and more. The network is designed with a strong emphasis on performance, scalability, redundancy, and availability. Key components include the allocation of specific IP address ranges for management, WLAN, LAN, VoIP, and DMZ, as well as the integration of advanced technologies such as VLAN segmentation, EtherChannel, and OSPF routing.

. To ensure seamless communication and robust security, the project implements a hierarchical network model with redundancy, spanning tree protocol enhancements, and wireless access points managed centrally through a Wireless LAN Controller (WLC). Additionally, the deployment of IP phones supports Voice over IP (VoIP) communication across departments. A Cisco ASA firewall secures the network with defined security zones, while Access Control Lists (ACLs) protect remote administrative access.

. The network’s backbone is supported by high-availability protocols such as HSRP, enabling load balancing and failover capabilities. Static and dynamic IP addressing are used appropriately for different devices, while a centralized DHCP server dynamically assigns IPs across the network. The entire system is tested thoroughly to ensure reliable communication, secure data flow, and smooth operations within the infrastructure.