Hotel Management Network Design

Abstract

In today's hospitality sector, a reliable and secure network infrastructure is the essential for providing smooth guest services and optimizing internal operations. The design and implementation of a hotel management network using the Cisco Packet Tracer focuses primarily on an accurate enterprise architecture that is organized, scalable, and secure. The proposed network topology uses Virtual Local Area Networks (VLANs) to enhance the network security and bandwidth by segmenting its traffic among the functional areas of guest access, front desk operations, management, housekeeping, and maintenance. Thus, necessary core components such as switches, routers, and wireless access points were configured and deployed to establish wired and wireless connectivity throughout the building. Routing and device management are also improved through the systemic application of IP addressing schemes, which states how certain hosts are configured; i.e., whether they will be static or be automatically allocated. The complement of essential security protocols including port security mechanisms, DHCP snooping and ACLs ensures data protection with controlled access. Furthermore, the integration of dynamic routing using Open Shortest Path First (OSPF) protocol is introduced to improve routing efficiency and network scalability across departments. Functional validation is performed by evaluating parameters such as flow of traffic between departments, isolation of guest access as well as inter-VLAN communication with simulated real-world scenarios within Packet Tracer. To constitute a complete enterprise-level deployment into simulation, additional services such as IP telephony, internet gateway access, and centralized printing have been incorporated. This project shall thus serve as a very good practice model in having network design, configuration, and simulation to provide practical and educational model for network administrator or IT professional in the hospitality industry. Cisco Packet Tracer, is a very low-cost option and ultimately, using the it reinforces the benefits of this tool for both educational and planning purposes for use in real-time network installations.

Keywords: Hotel network design, VLAN, Cisco Packet Tracer, enterprise network, network security, network simulation, inter-VLAN routing.

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