

Computer Network Design of the Faculty of Computer Science Using DHCP Server configuration in Cisco Packet Tracer

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Abstract

Background - Computer Networks are now an important component in supporting academic activities in the faculty of computer science. An effective and efficient computer network is needed to support access to digital resources, communication between users, data management, data sharing and devices. One of the challenges in network management is the configuration of IP Addresses for devices connected to the computer network. The large number of connected devices makes manual configuration of IP Addresses inefficient and prone to errors.

Purpose - The purpose of this network design is to overcome the challenges of manual IP address management which often causes configuration errors and reduces network performance.

methodology - 1. Literature Review 2. Field Network Inspection 3. Network Design and Simulation 4. Testing and Analysis 5. Report Preparation

Findings - The simulation results show that the DHCP Server configuration successfully optimizes IP address distribution, reduces the risk of errors, and improves network operational efficiency. This design supports centralized and distributed connectivity, connecting areas such as the Computer Lab, Faculty Office, Administration Room, and SmartClass with reliable network performance and low latency.

Originality - This research is expected to produce a network design that meets minimum network standards, with even network distribution, automatic IP address management, and optimal configuration. This research is limited to the design of network topology and implementation of DHCP in simulation.

Keywords: Computer Network, Cisco Packet Tracer, DHCP, LAN, Hybrid Topology
