

ABSTRAK

SISTEM PENGENDALIAN ROUTING OTOMATIS BERBASIS IOT

PADA JARINGAN TELEKOMUNIKASI

(2025 : + PAGES + HALAMAN + GAMBAR + TABEL + LAMPIRAN)

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Perkembangan teknologi *Internet of Things* (IoT) memberikan peluang untuk meningkatkan efisiensi pengelolaan jaringan telekomunikasi melalui sistem otomatis. Penelitian ini bertujuan merancang dan mengimplementasikan sistem pengendalian routing otomatis berbasis IoT yang mampu memilih jaringan terbaik berdasarkan kualitas sinyal secara real-time. Sistem menggunakan ESP32 sebagai mikrokontroler utama, relay sebagai pengalih jalur koneksi, router 4G, serta LCD sebagai media tampilan status sistem. Parameter kualitas jaringan yang dipantau meliputi RSRP, RSRQ, RSSI, SINR, kecepatan upload, kecepatan download, dan ping. Data tersebut dikirim dan dimonitor melalui platform Remote-RED, sehingga kondisi jaringan dapat dipantau dari jarak jauh. Berdasarkan hasil pengujian, sistem mampu melakukan perpindahan routing secara otomatis ketika kualitas jaringan menurun dan memilih jaringan dengan performa yang lebih baik. Implementasi sistem ini dapat meningkatkan kestabilan koneksi internet, mengurangi waktu gangguan, serta mendukung pengelolaan jaringan telekomunikasi yang lebih efektif dan efisien.

Kata kunci: *Internet of Things* (IoT), routing otomatis, ESP32, RemoteRED, kualitas jaringan, telekomunikasi.

ABSTRACT

IOT-BASED AUTOMATIC ROUTING CONTROL SYSTEM FOR TELECOMMUNICATION NETWORKS

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The development of Internet of Things (IoT) technology has created opportunities to improve the efficiency of telecommunication network management through automated systems. This study aims to design and implement an IoT-based automatic routing control system capable of selecting the best network based on real-time signal quality. The system utilizes an ESP32 microcontroller as the main controller, a relay for switching network routes, a 4G router, and an LCD to display the system status. Network quality parameters monitored include RSRP, RSRQ, RSSI, SINR, upload speed, download speed, and ping. The collected data are transmitted and monitored remotely using the RemoteRED platform, enabling real-time network supervision. The testing results indicate that the proposed system is capable of automatically switching the routing path whenever network quality decreases and selecting the network with better performance. This implementation improves internet connection stability, reduces network downtime, and supports more effective and efficient telecommunication network management.

Keywords: *Internet of Things (IoT), automatic routing, ESP32, RemoteRED, network quality, telecommunication.*