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(57) Abstract :
 ENERGY-EFFICIENT ADAPTIVE WIRELESS COMMUNICATION PROTOCOL WITH ENHANCED SECURITY FOR IOT DEVICES IN HETEROGENEOUS NETWORKS ABSTRACT The present invention discloses an energy-efficient adaptive wireless communication system 100 with enhanced security for IoT devices in heterogeneous networks. The system comprises a plurality of IoT devices 110, each equipped with a low-power transceiver for data transmission and an adaptive communication module that dynamically adjusts transmission parameters based on network conditions and device power requirements. A data encryption unit provides secure communication using a cryptographic protocol optimized for low energy usage. The system also includes a network management server 112, featuring a heterogeneous network interface that manages multiple communication standards, an energy optimization module for adjusting transmission schedules based on battery levels, and a security management unit for real-time threat analysis and adaptive security protocols. A protocol adaptation layer 114 dynamically switches communication standards to maximize power efficiency, while a monitoring module 116 evaluates network conditions and initiates adaptive responses to ensure secure, low-power communication across diverse networks.

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