

ABSTRACT

The exponential rise of online advertising has increasingly strained computer networks, consuming valuable bandwidth and disrupting user experience. Much of this strain stems from third-party ads that introduce unnecessary data traffic, degrading network efficiency. This study tackles the challenge of mitigating this digital clutter by proposing a network-level ad-blocking system aimed at reducing bandwidth waste while preserving service quality.

Leveraging a combination of Raspberry Pi 4, MikroTik RouterBOARD, and DNS *filtering*, the proposed solution blocks ad *domains* at the network layer—intercepting unwanted content before it reaches user devices. This proactive approach not only eliminates excessive data requests but also provides a lightweight, cost-effective method suitable for small to medium-scale networks.

Performance evaluations reveal promising results: achieving up to 40% bandwidth utilization savings. Additionally, 64 users were surveyed and expressed satisfaction with the system's impact. While minimal Quality of Service (QoS) degradation was observed, it remained well within the "highly acceptable" range based on TIPHON standards. These outcomes highlight the potential of DNS-based ad blocking as a practical and scalable strategy to boost network responsiveness and improve overall user experience.

Keywords: Advertisement Blocking, Network Quality, Raspberry Pi, MikroTik, DNS Filtering