

Zainal Abidin. 2026. *Penerapan Manajemen Bandwidth Metode Token Bucket Berbasis Mikrotik Untuk Meningkatkan QoS Jaringan Di SMKN 1 Kwanyar*. Skripsi, Program Studi Pendidikan Informatika, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Trunodjoyo Madura. Pembimbing 1: Muhlis Tahir

ABSTRAK

Penelitian ini bertujuan untuk menerapkan manajemen *bandwidth* menggunakan metode *Token Bucket* berbasis MikroTik guna meningkatkan *Quality of Service* (QoS) pada jaringan Laboratorium Komputer SMKN 1 Kwanyar. Penelitian ini menggunakan metode *Network Development Life Cycle* (NDLC) yang meliputi tahapan *analysis*, *design*, *simulation prototyping*, *implementation*, *monitoring*, dan *management*. Pengumpulan data dilakukan melalui observasi, wawancara, dokumentasi, pengujian jaringan menggunakan *Wireshark* dan *Speedtest*, serta validasi oleh Ahli Jaringan dan Kepala Laboratorium Komputer. Hasil penelitian menunjukkan bahwa penerapan metode *Token Bucket* mampu mengatur distribusi *bandwidth* secara lebih merata sehingga meningkatkan kualitas layanan jaringan. Hasil pengujian *QoS* menunjukkan bahwa pada jaringan WLAN nilai *packet loss* menurun dari 12,2% menjadi 3,8%, sedangkan pada jaringan LAN nilai *throughput* meningkat dari 29,062 Kbit/s menjadi 12,127 Mbit/s, *delay* menurun dari 95,90 ms menjadi 0,58 ms, dan *jitter* menurun dari 95,92 ms menjadi 0,58 ms. Hasil validasi oleh Ahli Jaringan memperoleh persentase sebesar 84,44% sebelum implementasi dan 90% sesudah implementasi, sedangkan Kepala Laboratorium Komputer memperoleh persentase sebesar 86,67% sebelum implementasi dan 90% sesudah implementasi. Berdasarkan hasil tersebut, dapat disimpulkan bahwa penerapan manajemen *bandwidth* menggunakan metode *Token Bucket* efektif dalam meningkatkan kualitas layanan jaringan dan berada pada kategori Sangat Layak untuk diterapkan di Laboratorium Komputer SMKN 1 Kwanyar.

Kata kunci: *Token Bucket*, Manajemen *Bandwidth*, MikroTik, *Quality of Service* (QoS), *Network Development Life Cycle* (NDLC).

Zainal Abidin. 2026. *Implementation of MikroTik-Based Token Bucket Bandwidth Management to Improve Network Quality of Service (QoS) at SMKN 1 Kwanyar. Undergraduate Thesis, Informatics Education Study Program, Faculty of Teacher Training and Education, Universitas Trunodjoyo Madura. Supervisor I: Muhlis Tahir.*

ABSTRACT

This study aims to implement Token Bucket-based bandwidth management using MikroTik to improve the Quality of Service (QoS) of the computer network at the Computer Laboratory of SMKN 1 Kwanyar. This research employed the Network Development Life Cycle (NDLC) method, which consists of the stages of analysis, design, simulation prototyping, implementation, monitoring, and management. Data were collected through observation, interviews, documentation, network testing using Wireshark and Speedtest, and system validation by a Network Expert and the Head of the Computer Laboratory. The results indicate that the implementation of the Token Bucket method successfully distributes bandwidth more efficiently and evenly, thereby improving network service quality. The QoS test results showed that the packet loss value on the WLAN network decreased from 12.2% to 3.8%, while on the LAN network, throughput increased from 29.062 Kbit/s to 12.127 Mbit/s, delay decreased from 95.90 ms to 0.58 ms, and jitter decreased from 95.92 ms to 0.58 ms. The validation results by the Network Expert achieved a score of 84.44% before implementation and 90% after implementation, while the Head of the Computer Laboratory obtained 86.67% before implementation and 90% after implementation. Based on these findings, it can be concluded that the implementation of Token Bucket-based bandwidth management is effective in improving network service quality and is categorized as Highly Feasible for implementation in the Computer Laboratory of SMKN 1 Kwanyar.

Keywords: *Token Bucket, Bandwidth Management, MikroTik, Quality of Service (QoS), Network Development Life Cycle (NDLC).*