

ABSTRAK

Pengelolaan jaringan di lingkungan akademik sering kali menghadapi kendala akibat pembagian bandwidth yang bersifat statis, sehingga memicu kongesti pada jam sibuk perkuliahan. Penelitian ini bertujuan menerapkan algoritma Decision Tree C4.5 untuk mengklasifikasikan karakteristik trafik jaringan sebagai landasan memberikan rekomendasi kebijakan Quality of Service (QoS). Pengumpulan data lalu lintas jaringan dilakukan menggunakan TShark pada server di Fakultas Ilmu Komputer. Hasil investigasi log server mengonfirmasi adanya anomali performa berupa lonjakan packet loss mencapai 34,2% pada pukul 11.00-15.00 WIB. Melalui pengujian pemodelan algoritma C4.5 memetakan karakteristik lalu lintas data, di mana aktivitas Browsing teridentifikasi sebagai trafik dominan. Berdasarkan pola pohon keputusan tersebut, dirumuskan cetak biru (*blueprint*) rekomendasi QoS menggunakan metode *Hierarchical Token Bucket (HTB)* dan *Per Connection Queue (PCQ)* pada MikroTik dengan memetakan Browsing pada Priority 2 (*High*), Gaming pada Priority 3 (*Medium-High*), Streaming pada Priority 5 (*Medium*), serta pengunduhan (Download) pada Priority 6 (*Low*) berskala drop paket selektif (*Random Early Detection*). Berdasarkan *traffic shaping threshold*, kebijakan ini diproyeksikan mampu menekan nilai *packet loss* menuju batas aman di bawah 3%, sehingga diharapkan dapat menjadi panduan strategis bagi pengelola jaringan.

Kata kunci: *Bandwidth Management, Decision Tree C4.5, Klasifikasi Trafik, Quality of Service (QoS),*

ABSTRACT

Network management in academic environments often faces obstacles due to static bandwidth allocation, which triggers congestion during peak lecture hours. This study aims to apply the Decision Tree C4.5 algorithm to classify network traffic characteristics as a basis for providing Quality of Service (QoS) policy recommendations. Network traffic data collection was conducted using TShark on a server at the Faculty of Computer Science. The results of server log investigations confirmed a performance anomaly in the form of a spike in packet loss reaching 34.2% at 11:00-15:00 WIB. Through modeling testing, the C4.5 algorithm maps the characteristics of data traffic, where Browsing activity is identified as the dominant traffic. Based on the decision tree pattern, a blueprint for QoS recommendations is formulated using the Hierarchical Token Bucket (HTB) and Per Connection Queue (PCQ) methods on MikroTik by mapping Browsing at Priority 2 (High), Gaming at Priority 3 (Medium-High), Streaming at Priority 5 (Medium), and Download at Priority 6 (Low) on a selective packet drop scale (Random Early Detection). Based on the traffic shaping threshold, this policy is projected to be able to suppress packet loss values to a safe limit below 3%, so it is expected to be a strategic guide for network managers.

Keywords: *Bandwidth Management, Decision Tree C4.5, Traffic Classification, Quality of Service (QoS),*