

ABSTRAK

Jaringan WiFi di SMK Muhammadiyah 1 Ajibarang sebelumnya masih menggunakan akses yang sama antara guru dan siswa, baik dari sisi SSID maupun kata sandi, tanpa adanya autentikasi individual dan pembatasan *bandwidth*. Kondisi tersebut menyebabkan gangguan koneksi, meningkatkan risiko penyalahgunaan akses, serta menyulitkan administrator dalam melakukan pengawasan dan penelusuran gangguan jaringan. Penelitian ini bertujuan untuk: (1) menganalisis kondisi jaringan WiFi yang sedang berjalan di SMK Muhammadiyah 1 Ajibarang sebagai dasar perancangan solusi pemisah akses guru dan siswa; (2) merancang dan menerapkan kontrol akses jaringan WiFi berbasis autentikasi Mikrotik yang dapat memisahkan akses jaringan guru dari jaringan siswa; dan (3) menguji hasil implementasi kontrol akses pada jaringan WiFi guru dan siswa, baik dari sisi keberhasilan autentikasi maupun pembagian *bandwidth* pada masing-masing jaringan. Metode pengembangan yang digunakan dalam penelitian ini adalah *Network Development Life Cycle* (NDLC) yang terdiri atas enam tahapan, yaitu *analysis*, *design*, *simulation prototyping*, *implementation*, *monitoring*, dan *management*. Penelitian dilaksanakan di SMK Muhammadiyah 1 Ajibarang dengan jumlah civitas akademika kurang lebih 78 orang guru dan 1.458 siswa. Pengumpulan data dilakukan melalui observasi, wawancara, dan studi pustaka. Hasil pengujian menunjukkan bahwa mekanisme autentikasi *hotspot* berjalan dengan benar, aturan *firewall* berhasil mengisolasi lalu lintas antar segmen jaringan sehingga guru dan siswa tidak dapat saling mengakses, serta fitur *Simple Queue* berhasil membatasi kecepatan akses sesuai dengan rancangan yang ditetapkan. Penerapan metode NDLC terbukti efektif menghasilkan proses implementasi kontrol akses jaringan yang sistematis, terstruktur, dan terdokumentasi dengan baik di SMK Muhammadiyah 1 Ajibarang.

Kata kunci: Mikrotik, kontrol akses jaringan, autentikasi *hotspot*, manajemen *bandwidth*, NDLC.

ABSTRACT

The WiFi network at SMK Muhammadiyah 1 Ajibarang previously provided the same access to both teachers and students in terms of SSID and password, without individual authentication or bandwidth limitations. This condition resulted in connectivity disruptions, increased the risk of unauthorized network access, and made it difficult for administrators to monitor and troubleshoot network issues. This study aims to: (1) analyze the existing WiFi network conditions at SMK Muhammadiyah 1 Ajibarang as a basis for designing a solution to separate teacher and student access; (2) design and implement WiFi network access control based on MikroTik authentication to separate teacher access from student access; and (3) evaluate the implementation of access control on the teacher and student WiFi networks in terms of authentication success and bandwidth allocation for each network. The development method used was the Network Development Life Cycle (NDLC), which consists of six stages: analysis, design, simulation prototyping, implementation, monitoring, and management. The research was conducted at SMK Muhammadiyah 1 Ajibarang, with approximately 78 teachers and 1,458 students. Data were collected through observation, interviews, and a literature review. The test results showed that the hotspot authentication mechanism functioned properly, the firewall rules successfully isolated traffic between network segments, preventing teachers and students from accessing each other's networks, and the Simple Queue feature successfully limited access speeds according to the predetermined design. The implementation of the NDLC method proved effective in producing a systematic, structured, and well-documented process for implementing network access control at SMK Muhammadiyah 1 Ajibarang.

Keywords: Mikrotik, network access control, hotspot authentication, bandwidth management, NDLC