

Muhammad Syahrul Fawaid. 2026. *Implementasi Arsitektur Keamanan Jaringan Sekolah Menggunakan Sistem Monitoring Zabbix dan Firewall Iptables*. Skripsi, Program Studi Pendidikan Informatika, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Trunodjoyo Madura. Pembimbing : Muhlis Tahir, S.Pd., M.Tr.Kom.

ABSTRAK

Tingginya ancaman siber pada sektor pendidikan, termasuk insiden *ransomware* yang pernah terjadi di MA Manbaul Ulum, menegaskan arti penting penerapan perlindungan infrastruktur digital yang tangguh. Penelitian ini bertujuan untuk mengimplementasikan, menguji, dan mengevaluasi kinerja arsitektur keamanan jaringan terintegrasi berbasis sistem *monitoring* Zabbix dan *firewall* IPTables dengan mengacu pada standar ISO/IEC 27001:2022. Penelitian ini menerapkan metode *Network Development Life Cycle* (NDLC) yang divalidasi kelayakannya oleh ahli jaringan dan kepala laboratorium. Pengujian sistem dilakukan melalui simulasi lima serangan spesifik: *SSH Brute Force*, *HTTP Flood*, *Web Attack*, *Port Scanning*, dan *Command and Control* (C2). Hasil penelitian membuktikan bahwa integrasi kedua sistem berjalan sangat efektif; IPTables berhasil memblokir seluruh akses ilegal dari kelima serangan, sementara Zabbix proaktif mendeteksi anomali *real-time* dan mengirimkan *alert* otomatis via WhatsApp tanpa menimbulkan beban *overhead* yang signifikan pada *server*. Hasil validasi instrumen pasca-implementasi menunjukkan persentase sebesar 85% dari ahli jaringan dan 90% dari kepala laboratorium dengan kategori sangat tinggi. Sebagai simpulan, implementasi arsitektur Zabbix dan IPTables terbukti andal serta layak digunakan untuk mendeteksi ancaman sejak dini, mencegah serangan, dan menjaga stabilitas layanan digital di lingkungan sekolah.

Kata Kunci : Keamanan Jaringan, *Monitoring* Zabbix, *Firewall* IPTables, NDLC, ISO/IEC 27001:2022.

Muhammad Syahrul Fawaid. 2026. Implementation of School Network Security Architecture Using the Zabbix Monitoring System and IPTables Firewall. Thesis, Informatics Education Study Program, Faculty of Teacher Training and Education, Trunodjoyo University, Madura. Advisor: Muhlis Tahir, S.Pd., M.Tr.Kom.

ABSTRACT

The high level of cyber threats in the education sector, including the ransomware incident that occurred at MA Manbaul Ulum, emphasizes the importance of implementing robust digital infrastructure protection. This study aims to implement, test, and evaluate the performance of an integrated network security architecture based on the Zabbix monitoring system and IPTables firewall, referring to the ISO/IEC 27001:2022 standard. This study applies the Network Development Life Cycle (NDLC) method, whose feasibility was validated by network experts and laboratory heads. System testing was conducted through simulations of five specific attacks: SSH Brute Force, HTTP Flood, Web Attack, Port Scanning, and Command and Control (C2). The research results demonstrated that the integration of the two systems was highly effective; IPTables successfully blocked all unauthorized access from all five attacks, while Zabbix proactively detected real-time anomalies and sent automated alerts via WhatsApp without incurring significant server overhead. Post-implementation instrument validation results showed a very high approval rate of 85% from network experts and 90% from laboratory heads. In conclusion, the implementation of the Zabbix and IPTables architecture proved reliable and feasible for early threat detection, attack prevention, and maintaining the stability of digital services in school environments.

Keywords: Network Security, Zabbix Monitoring, IPTables Firewall, NDLC, ISO/IEC 27001:2022.