Utilization of Big Data Analytics for Traffic Management in Cybersecurity Systems Using Heuristic Methods

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ABSTRACT

The increasing volume of internet traffic in educational institution network infrastructures creates significant challenges in managing and monitoring cybersecurity. Various cyber threats such as bot activity, abnormal traffic patterns, and unauthorized access attempts require advanced analytical approaches to maintain network stability, availability, and security. This study aims to implement Big Data Analytics for traffic management within a cybersecurity system using heuristic detection methods. The system processes large-scale web server logs and network traffic data to identify suspicious activities based on predefined heuristic rules and traffic behavior patterns. The proposed system integrates log collection, real-time traffic monitoring, and heuristic-based threat detection mechanisms to analyze network activities and identify anomalies such as bot traffic, abnormal request patterns, HTTP errors, and potential malicious access attempts. Modern web technologies and data processing techniques are utilized to ensure efficient analysis and visualization of traffic data. The results indicate that the implementation of Big Data Analytics combined with heuristic detection methods can support network administrators in monitoring traffic activities, identifying potential security threats at an earlier stage, and improving the effectiveness of cybersecurity management within the network environment

Keywords: *Big Data Analytics, Cybersecurity, Traffic Management, Heuristic Detection, Network Security*