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TStrengthening Cybersecurity with Wazuh: Log-Based Threat Detection for a Resilient Digital World

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Abstract: The increasing sophistication of cybersecurity threats necessitates prompt detection and response by enterprises. An open-source security platform called Wazuh aids in efficient threat monitoring. Protecting vital systems and data requires effective threat detection, monitoring, and response.Among other things, it offers capabilities for malware detection, integrity checks, and log gathering. Conventional security solutions frequently operate independently, which might result in sluggish reactions and insufficient insights. In order to solve this, Wazuh offers a single platform that incorporates essential security functionalities like configuration evaluation, log analysis, intrusion detection, and vulnerability management. The major components of Wazuh—server, indexer, and dashboard—as well as how it gathers, analyzes, and presents data are described in this paper. Wazuh's modular design makes it simple to integrate with other platforms offering real-time detection and actionable insights to tackle modern security challenge**s**

Keywords: Wazuh, web-server, network, security, monitoring, attack.

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I. INTRODUCTION

As organizations face more complex IT environments and increased cyber threats, Wazuh offers an open-source platform to simplify threat detection, compliance management, and incident response. Wash’s modular and scalable architecture enables organizations to monitor diverse environments, ranging from on-premises systems to cloud-based infrastructures, providing real-time insights and proactive threat mitigation. By combining advanced analytics with intuitive visualization capabilities, Wazuh empowers Security teams to identify and respond to anomalies swiftly. Traditional security tools often operate in silos, leading to fragmented insights and delayed responses. Wazuh addresses these challenges by offering a comprehensive, unified platform that integrates critical security functionalities such as log analysis, intrusion detection, vulnerability management, and configuration assessment.

This paper provides a detailed exploration of Wazuh’s core components including the Wazuh Server, Indexer, and Dashboard and explains the operational workflows that drive its effectiveness. The discussion highlights how Wazuh's architecture seamlessly integrates with endpoints and scales to meet the demands of modern IT ecosystems, offering a versatile and comprehensive solution for managing today’s security As organizations face more complex IT environments and increased cyber threats, Wazuh offers an open-source platform to simplify threat detection, compliance management, and incident response. Wash’s modular and scalable architecture enables organizations to monitor diverse environments, ranging from on-premises systems to cloud-based infrastructures, providing real-time insights and proactive threat mitigation. By combining advanced analytics with intuitive visualization capabilities, Wazuh empowers Security teams to identify and respond to anomalies swiftly. Traditional security tools often operate in silos, leading to fragmented insights and delayed responses. Wazuh addresses these challenges by offering a comprehensive, unified platform that integrates critical security functionalities such as log analysis, intrusion detection, vulnerability management, and configuration assessment.

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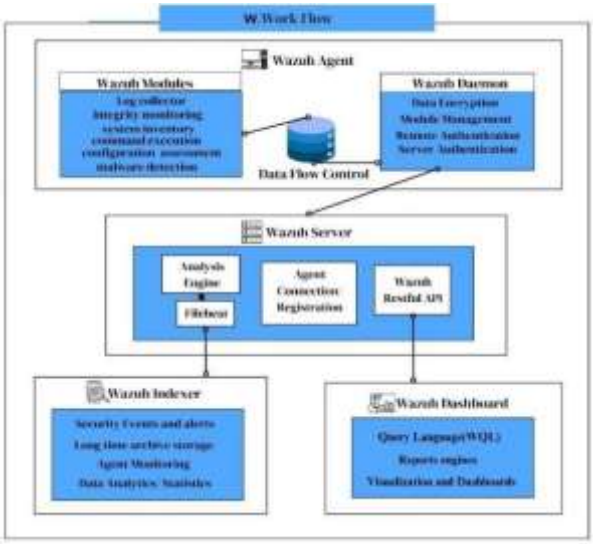
II. WAZUH OVERVIEW

Wazuh is an open-source security platform that provides threat detection, security monitoring, and compliance management. By combining multiple security tools into one platform, Wazuh simplifies operations and creates a seamless approach to cybersecurity. Its modular and scalable design makes it suitable for organizations of all sizes, from small businesses to large enterprises with complex IT systemsYour paper must be in single column format with a space of 4.22mm (0.17") between columns.

III. WAZUH WORKFLOW

Wazuh is an open-source security platform that provides unified XDR and SIEM capabilities. Its workflow involves several key components working together to monitor, detect, and respond to security threats across an organization's infrastructure. Here's an overview of Wazuh's workflow



Wazuh Agents: Installed on monitored endpoints (servers, workstations, cloud instances, etc.), these agents collect security-related data, including log events, file integrity.
Data Collection: Agents continuously gather data from their respective endpoints.
Data Forwarding: The collected data is securely transmitted from the agents to the Wazuh Server. Communication between agents and the server is encrypted
Wazuh Server: It receives data from all connected agents. It performs real-time analysis, correlates events, detects anomalies, and generates alerts based on predefined rules and threat intelligence feeds.
Event Analysis and Correlation: The server analyses incoming data to identify potential security threats. It correlates events from different sources to detect complex attack patterns, policy violations, or suspicious activities that may indicate a security incident.
Alert Generation: When a potential threat is identified, the server generates an alert detailing the nature of the issue, affected systems, severity level, and recommended actions. It helps security teams to prioritize and respond to incidents effectively.
Data Indexing and Storage: This allows for efficient searching, querying, and analysis of historical data, facilitating forensic investigations and compliance reporting.
Wazuh Dashboard: A web-based user interface that provides visualization and management capabilities. Security analysts can use the dashboard to monitor alerts, analyse security data, create custom dashboards, and manage the Wazuh deployment. **Response and Remediation:** Upon receiving alerts, security teams can initiate response actions directly from the Wazuh Dashboard. This may include isolating affected systems, blocking malicious IP addresses, or executing custom scripts to remediate identified threats.
Integration with External Tools: Wazuh integrates with various external tools and platforms, such as SIEM solutions, ticketing systems, and threat intelligence services, enhancing its capabilities and allowing for a more comprehensive security posture.

This workflow helps to maintain continuous security monitoring, promptly detect and respond to threats, and ensure compliance with regulatory requirements.

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Figure-2: Wazuh Security Events for Monitoring

IV. PAGE STYLE

All paragraphs must be indented. All paragraphs must be justified, i.e. both left-justified and right-justified.

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The entire document should be in Times New Roman. Type 3 fonts must not be used. Other font types may be used if needed for special purposes.
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Figures must be numbered using Arabic numerals. Figure captions must be in 10 pt Regular font. Captions of a single line must be centered whereas multi-line captions must be justified. Captions with figure numbers must be placed after their associated figures, as shown in Fig. 1.

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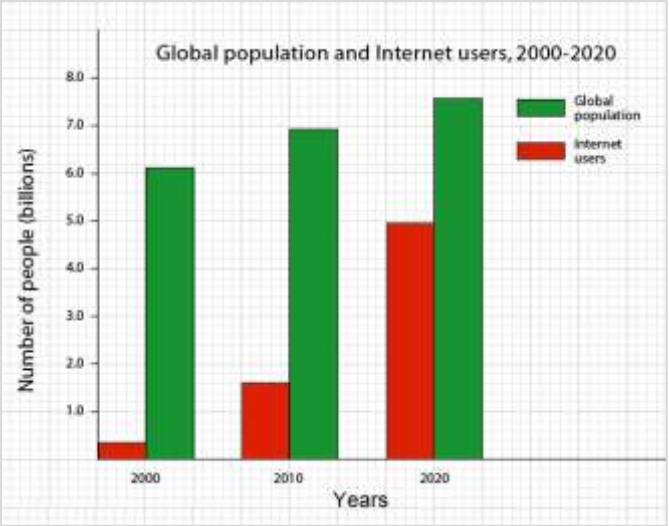

Fig. 1 A sample graph

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10	level-1 heading (in Small Caps), paragraph		level-2 heading, level-3 heading, author affiliation
11	author name		
24	title		

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- example of a datasheet in [9]
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V. CONCLUSION

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