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## Patent Search

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#### Abstract:

The Adaptive Intrusion Prevention System (AIPS) presented in this patent draft revolutionizes network security by integrating Machine Learning (ML) and Behavioral Analysis (BA) methodologies. Traditional intrusion prevention systems often fall short in detecting sophisticated threats and minimizing false positives. In response, AIPS dynamically adjusts its defense mechanisms based on real-time network behavior, effectively thwarting emerging threats while reducing false alarms. This innovation represents a comprehensive solution for modern network security, continually learning and adapting to evolving cyber threats for enhanced protection. Accompanied Drawing [FIGS. 1-2]

#### Complete Specification

Description:[001] The field of the present invention relates to network security systems, particularly to an Adaptive Intrusion Prevention System (AIPS) utilizing Machine Learning (ML) and Behavioral Analysis (BA) techniques for comprehensive network security. The invention encompasses methods and systems for dynamically adjusting defense mechanisms based on real-time analysis of network behavior, thereby effectively preventing intrusion attempts and minimizing false positives.

[002] Traditional intrusion prevention systems (IPS) typically rely on static rule sets and signature-based detection methods to identify and block known threats. However, these systems often struggle to detect zero-day attacks and sophisticated threats, leading to potential security breaches. Furthermore, the high rate of false positives generated by traditional IPS solutions contributes to alert fatigue among security personnel, reducing the effectiveness of threat response efforts.

[003] In response to these challenges, there is a growing demand for adaptive security solutions capable of evolving alongside emerging threats. The present invention addresses this need by integrating advanced ML algorithms and BA techniques into an Adaptive Intrusion Prevention System. By continuously learning from network traffic patterns and user behaviors, AIPS can dynamically adjust its defense mechanisms in real-time, effectively countering evolving threats while minimizing false positives.

[004] The Adaptive Intrusion Prevention System described herein represents a significant advancement in the field of network security technology. By combining the power of ML and BA, AIPS offers a proactive approach to network defense, capable of identifying anomalous behavior indicative of potential threats before they can cause harm. This innovation provides organizations with comprehensive protection for their critical assets, ensuring the integrity, confidentiality, and availability of their network infrastructure.

[005] In summary, the present invention significantly enhances the capabilities of traditional intrusion prevention systems by providing an adaptive defense mechanism that can evolve alongside emerging threats. By leveraging ML and BA techniques, AIPS offers a proactive and intelligent approach to network security, effectively mitigating

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