IntruAlert – A High Performance Network Intrusion Detection System

A PROJECT REPORT

Submitted by,

Mr. Likith G - 20211CIT0038
Mr. Kushaal G.P - 20211CIT0148
Mr. Gaurav Dhull - 20221LIN0006

Under the guidance of,

Ms. Raesa Razeen

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING, INTERNET OF THINGS [CIT].

At

PRESIDENCY UNIVERSITY

BENGALURU

DECEMBER 2024

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CERTIFICATE

This is to certify that the Project report **"HIGH PERFORMANCE NETWORK INTRUSION DETECTION SYSTEM"** being submitted by Likith G, Kushaal GP, Gaurav Dhull bearing roll number(s) 20211CIT0038,20211CIT0148, 20221LIN0006 in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering in Internet of Things is a bona fide work carried out under my supervision.

Ms. Raesa Razeen
Assistant Professor
School of CSE&IS
Presidency University

Dr. Anandraj
Professor & HoD
School of CSE&IS
Presidency University

Dr. L. SHAKKEERA
Associate Dean
School of CSE
Presidency University

Dr. MYDHILI NAIR
Associate Dean
School of CSE
Presidency University

Dr. SAMEERUDDIN KHAN
Pro-Vc School of Engineering
Dean -School of CSE&IS
Presidency University

PRESIDENCY UNIVERSITY

SCHOOL OF COMPUTER SCIENCE ENGINEERING

DECLARATION

We hereby declare that the work, which is being presented in the project report entitled **High Performance Network Intrusion Detection System** in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering in Internet of Things**, is a record of our own investigations carried under the guidance of **Raesa Razeen, Assistant Professor, School of Computer Science Engineering & Information Science, Presidency University, Bengaluru.**

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

Likith G - 20211CIT0038

Kushaal GP - 20211CIT0148

Gaurav Dhull - 20221LIN0006

ABSTRACT

The exponential growth of networked systems and the increasing sophistication of cyber threats have heightened the demand for reliable and efficient mechanisms to safeguard network integrity. This project, titled **"High Performance Network Intrusion Detection System (NIDS)"**, addresses this need by designing and implementing a lightweight, scalable, and efficient intrusion detection system tailored for small to medium-sized networks.

The primary goal of this project is to develop a solution that ensures real-time traffic monitoring and threat detection without reliance on resource-intensive techniques such as machine learning. By utilizing a signature-based approach and predefined rule sets, the system efficiently identifies malicious activities while maintaining low latency and high throughput. The detection mechanisms are optimized to handle large volumes of data traffic, ensuring accuracy and reliability.

The system is further enhanced with a user-centric interface for monitoring and interaction, providing clear and actionable insights into detected threats. Its modular architecture allows seamless integration into existing network infrastructures, making it a versatile and adaptable tool for organizations seeking cost-effective cybersecurity solutions.

Throughout the development process, emphasis was placed on performance optimization, resource efficiency, and real-time operability. The project demonstrates that high-performance intrusion detection can be achieved through strategic design choices, rigorous testing, and efficient utilization of computational resources.

This work underscores the importance of lightweight yet effective network security solutions in the modern digital landscape and provides a foundation for future enhancements and scalability in intrusion detection systems.

ACKNOWLEDGEMENT

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We are greatly indebted to our guide **Ms. Raesa Razeen, Assistant Professor** and Reviewer **Dr. Nihar Ranjan Nayak, Professor, Assistant Professor** School of Computer Science Engineering & Information Science, Presidency University for their inspirational guidance, and valuable suggestions and for providing us a chance to express our technical capabilities in every respect for the completion of the project work.

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We thank our family and friends for the strong support and inspiration they have provided us in bringing out this project.

Likith G

Kushaal G.P

Gaurav Dhull