THE REPUBLIC OF INDONESIA DEFENSE UNIVERSITY

MODSECURITY WEB APPLICATION FIREWALL AS CYBER THREAT DETERRENCE IN INDONESIAN NAVY TO STRENGTHEN CYBER DEFENSE

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CYBER DEFENSE ENGINEERING

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This Thesis was Written for the Fulfillment of the Requirements
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STATEMENT OF ORIGINALITY

I hereby declare that in this thesis there is no work or part that has ever been submitted for a degree at any level at a university, and to the best of my knowledge there are no terms, phrases, sentences, paragraphs, subsections or chapters from the work that have ever been written. or published, except as submitted in writing in this manuscript and mentioned in the bibliography.

If it is later proven that there is plagiarism in this thesis, I am willing to accept sanctions in accordance with the provisions of the applicable regulations/laws.

Bogor, January 26th 2024

Abdillah Imam Julianto

FOREWORD

The researcher would like to express his gratitude to the presence of God Almighty, because of His mercy and grace in preparing the thesis with the title Preventing Cyber Threats Using the ModSecurity Web Application Firewall on the Indonesian Navy's Information System in Order to Improve Cyber Defense can be resolved.

The preparation of this thesis is intended as one of the requirements for obtaining a Master's degree in the Cyber Defense Engineering Study Program, Faculty of Defense Science and Technology, Defense University.

The preparation of this thesis was completed thanks to the help and support from various parties, both directly and indirectly. For this reason, on this occasion the researcher would like to thank:

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The researcher realizes that this thesis is still imperfect, therefore the researcher humbly hopes for constructive criticism and suggestions to support the perfection of this research.

Finally, we hope that this thesis can provide benefits to the development of defense science and be useful for stakeholders in efforts to improve national security and defense in the cyber sector.

Bogor, January 26th 2024

Abdillah Imam Julianto

ABSTRACT

MODSECURITY WEB APPLICATION FIREWALL AS CYBER THREAT DETERRENCE IN INDONESIAN NAVY TO STRENGTHEN CYBER DEFENSE

ABDILLAH IMAM JULIANTO

The development of information technology today has had a significant impact on the use of websites in various sectors including the military. In addition to facilitating the optimal dissemination of information, the use of websites can cause information security problems related to Confidentiality, Integrity, and Availability. Indonesian Navy perimeter data shows Indonesian Navy sites faced 2,720,027 significant attacks. In the period February 2022 to September 2023, 290 cases of defacement attacks were found on Indonesian Navy websites related to online gambling using the Google dorking method. The aim of this research is to propose the use of an open source-based Web Application Firewall (WAF), especially ModSecurity which is integrated with Yara Rules to complement system security and become an alternative to the existing WAF (Imperva). This research method is a quantitative experimental method used to compare the performance of the developed WAF with the existing WAF. The results of research testing using ModSecurity on WAF Imperva with SQL injection attacks show that the test resulted in detection of 90.84% and an increase of 0.16%, while XSS attacks were able to prevent 99.94% with an increase in detection of 2.40%. Other test results on Malware attacks show that the ModSecurity integration test results with Yara Rules on WAF Imperva can provide malware detection and prevention of 90.88%, this shows an increase of 0.04%. It is hoped that this research can be an alternative solution in handling the Indonesian Navy's security system infrastructure.

Keywords: Cyber Threats, ModSecurity, SQL Injection, Web Application Firewall, Yara Rules.

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