



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
FACULTY OF SCIENCE AND DEFENSE TECHNOLOGY
THE REPUBLIC OF INDONESIA DEFENSE UNIVERSITY
BOGOR
2024**



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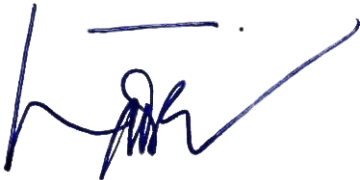


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This Thesis was Written for the Fulfillment of the Requirements
To Earn Master's Degree in Defense Science

**CYBER DEFENSE ENGINEERING
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THE REPUBLIC OF INDONESIA DEFENSE UNIVERSITY
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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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3. Navy Captain (E) Dr. HA Danang Rimbawa, S.Sc., MT, M.Tr.Opsla., CEH, CSBA And Mr. Yudistira Dwi Wardana ST, Ph.D as supervisors I and supervisors II for their support and guidance so far and for providing direction to researchers so that this proposal can be completed.
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May God Almighty repay the kindness of various parties for their assistance.

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

A handwritten signature in black ink, appearing to read 'aimto', with a long horizontal stroke underneath.

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.

LIST OF CONTENTS

COVER PAGE.....	i
TITLE PAGE	ii
THESIS APPROVAL SHEET	iii
THESIS VALIDATION SHEET.....	iv
STATEMENT OF ORIGINALITY	v
FOREWORD	vi
ABSTRACT	viii
LIST OF CONTENTS	ix
LIST OF FIGURES	xi
LIST OF TABLES	xiii
CHAPTER I INTRODUCTION	1
1.1 Background	1
1.2 Identification of problems.....	6
1.3 Restricting the problem.....	6
1.4 Formulation of the problem.....	7
1.5 Research purposes	7
1.6 Benefits of research	7
CHAPTER II LITERATURE REVIEW	9
2.1 Theoretical basis	9
2.2 Previous Research Results	23
2.3 Framework	30
CHAPTER III RESEARCH METHODOLOGY	32
3.1. Research Methods and Design	32
3.1. Place and time of research.....	34
3.3 Research Instrument.....	35
3.4 Data collection technique	39
3.5 Data analysis technique	39
3.6 Testing Scenarios.....	41
CHAPTER IV RESEARCH RESULTS AND DISCUSSION	44
4.1 Data Description.....	44
4.2 Testing.....	58

4.3 Discussion	61
CHAPTER V CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS	70
5.1. Conclusion.....	71
5.2. Implications	71
5.3. Recommendations.....	72
BIBLIOGRAPHY	73
ATTACHMENT	76

LIST OF FIGURES

Figure 1.1 2023 Internet User Penetration & Behavior Survey	1
Figure 1. 2 OWASP Top 10-2021	3
Figure 1. 3 Google Dorking Web defacement attacks on Indonesian Navy sites	4
Figure 1. 4 Zone-H Defacement Attack Sites for Indonesian Navy Sites.....	4
Figure 2. 1 Theoretical Foundation.....	9
Figure 2. 2 Cyber Defense Phase	12
Figure 2. 3 Web Defacement Attacks in 2022	13
Figure 2. 4 SIEM architecture	17
Figure 2. 5 Total attacks on the Indonesian Navy.....	19
Figure 2. 6 Examples of Yara Rules	20
Figure 2. 7 Frameworks for Thought.....	31
Figure 3. 1 Imperva Research Work Design,.....	33
Figure 3. 2 Topology of the virtual laboratory in the simulation environment.....	36
Figure 3.3 Virtual laboratory topology in a production environment.....	37
Figure 3. 4 Appearance of the target website	38
Figure 3. 5 Wazuh Architecture	40
Figure 3. 6 Attack Scenarios.....	43
Figure 4. 1 Implementation of WAF Imperva in the Indonesian Navy	44
Figure 4. 2 ModSecurity WAF topology	45
Figure 4. 3 How WAF ModSecurity works	46
Figure 4. 4 Malware detection process	46
Figure 4. 5 Development topology	48
Figure 4. 6 WAF Dashboard page on SIEM with WAF Imperva	49
Figure 4. 7 Modsec WAF Dashboard page in SIEM	50
Figure 4. 8 Malware Dashboard Page in SIEM.....	50
Figure 4. 9 Malware Detection Dashboard page in SIEM	51
Figure 4. 10 SQL Injection Test Results on Target 1	51
Figure 4. 11 SQL Injection Test Results on Target 2	52
Figure 4. 12 SQL Injection Test Results on Target 3	53
Figure 4. 13 XSS Test Results on Target 1	54
Figure 4. 14 XSS Test Results on Target 2	55

Figure 4. 15 XSS Test Results on Target 3	56
Figure 4. 16 Results of Malware Injection Testing on Target 1	57
Figure 4. 17 Results of Malware Injection Testing on Target 2	57
Figure 4. 18 Results of Malware Injection Testing on Target 3	58
Figure 4. 19 Unblocked attacks by WAF Imperva.....	62
Figure 4. 20 Error-based SQL Injection attacks are not blocked	63
Figure 4. 21 Payload of database extraction experiments	63
Figure 4. 22 Causes of response 200 from database extraction payload execution..	64
Figure 4. 23 If else logic that prints a message on the login page	64
Figure 4. 24 Imperva WAF unblocked attacks	65
Figure 4. 25 Unblocked attacks on Target 3	65
Figure 4. 26 XSS payload detected as SQL Injection	66
Figure 4. 27 Response code 200 due to payload printed on the login page	66
Figure 4. 28 CPU increase when malware injection is carried out.....	68

LIST OF TABLES

Table 2.1 Recapitulation of Cyber Incidents in 2022.....	12
Table 2. 2 Web Defacement Attacks in 2022.....	13
Table 2. 3 Previous Research	25
Table 3. 1 Research Time	35
Table 3. 2 Virtual laboratory hardware specifications in the simulation environment .	36
Table 3. 3 Target specifications	37
Table 3. 4 WAF Testing Scenarios	41
Table 4. 1 Results of scenario 1	52
Table 4. 2 Types of attack categories for scenario 1	52
Table 4. 3 Results of scenario 2	53
Table 4. 4 Types of attack categories for scenario 2	53
Table 4. 5 Results of scenario 3	54
Table 4. 6 Types of attack categories for scenario 3	54
Table 4. 7 Results of scenario 4	54
Table 4. 8 Types of attack categories for scenario 4	55
Table 4. 9 Scenario table 5.....	55
Table 4. 10 Types of attack categories for scenario 5	56
Table 4. 11 Scenario table 6.....	56
Table 4. 12 Types of attack categories for scenario 6	56
Table 4. 13 Results of scenario 7	57
Table 4. 14 Results of scenario 8	58
Table 4. 15 Scenario table 9.....	58
Table 4. 16 SQL Injection attack detection	59
Table 4. 17 XSS Attack Detections.....	59
Table 4. 18 SQL Injection security controls	60
Table 4. 19 Security control XSS.....	60
Table 4. 20 Malware injection detection.....	60
Table 4. 20 Security controls for malware injection.....	61