



FINAL YEAR PROJECT REPORT

SECURPROBE

**In fulfillment of the requirement
For degree of
BS (COMPUTER SCIENCES)**

By

**USAMA ASHRAF
M. AHSAN ARSHAD
ALIYAN REHMAN**

**70133 (BSCS)
70439 (BSCS)
70138 (BSCS)**

SUPERVISED

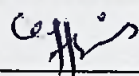
**BY
MR. MALIK M ALI**

BAHRIA UNIVERSITY (KARACHI CAMPUS)

SPRING-2024

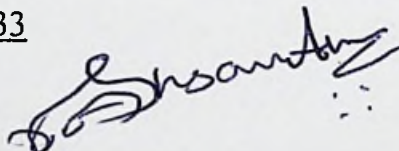
DECLARATION

We hereby declare that this project report is based on our original work except for citations and quotations which have been duly acknowledged. We also declare that it has not been previously and concurrently submitted for any other degree or award at Bahria University or other institutions.

Signature : 

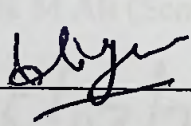
Name : Usama Ashraf

Reg No. : 70133

Signature : 

Name : Muhammad Ahsan Arshad Manzoor

Reg No. : 70439

Signature : 

Name : Aliyan Rehman

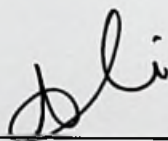
Reg No. : 70138

Date : 05/07/24

APPROVAL FOR SUBMISSION

We certify that this project report entitled “SECURPROBE” was prepared by **USAMA ASHRAF, M AHSAN ARHSAD, ALIYAN REHMAN** has met the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Science in Bachelor of **Computer Science** at Bahria University, Karachi.

Approved by,

Signature : 

Supervisor: Malik M Ali (Senior Assistant Professor)

Date : 5/07/24

The copyright of this report belongs to Bahria University according to the Intellectual Property Policy of Bahria University BUORIC-P15 amended on April 2019. Due acknowledgement shall always be made of the use of any material contained in, or derived from, this report.

© 2024 Bahria University. All right reserved.

ACKNOWLEDGEMENTS

We would like to thank everyone who had contributed to the successful completion of this project. We would like to express our gratitude to our project supervisor, Mr. Malik M. Ali (Senior Assistant Professor) for his guidance, advice, and his enormous patience throughout the development of the research.

Specially dedicated to

My beloved grandmother, mother and father

(Usama Ashraf)

My beloved grandmother, mother and father

(Muhammad Ahsan Arshad Manzoor)

My beloved grandmother, mother and father

(Aliyan Rehman)

ACKNOWLEDGEMENTS

We would like to thank everyone who had contributed to the successful completion of this project. We would like to express my gratitude to my project supervisor, Mr Malik M Ali (Senior Assistant Professor) for his invaluable advice, guidance and his enormous patience throughout the development of the research.

In addition, we would also like to express our gratitude to our loving parents and friends who have helped and given us encouragement.

SECURPROBE

TABLE OF CONTENTS

ABSTRACT

In an increasingly digital world, the security of web applications has become paramount. To address these evolving challenges, we present Securprobe, an innovative web application poised to redefine the field of penetration testing. Securprobe is engineered to streamline the penetration testing process, eradicating the need for users to download or install additional software. Our platform empowers users to conduct reconnaissance, vulnerability scanning, and manual penetration testing seamlessly, all within a user-friendly and convenient interface. Securprobe comprises distinct sections, each dedicated to a specific facet of security assessment. The reconnaissance section leverages tools like whois, dig, and subdomain enumeration to provide users with a comprehensive view of their target. The web vulnerability scanning component employs advanced techniques for the detection of vulnerabilities, including SQL injection (SQLi) and cross-site scripting (XSS). Additionally, Securprobe offers version-based vulnerability detection and assessments for common configuration flaws, going beyond automated scanning by providing detailed reports and CVE information based on identified vulnerabilities. A standout feature of Securprobe is its seamless integration of Kali Linux, a potent penetration testing operating system. With no additional setup or installations required, users can effortlessly launch a Kali Linux environment within the application, facilitating manual penetration testing operations. This project report meticulously scrutinizes Securprobe's technological architecture, feature set, and user interface, recognizing its potential to catalyse fundamental shifts in the cybersecurity landscape, akin to transformative platforms like Hack the Box, Rapid7, OWASP, Qualys, and Cloudflare. Securprobe heralds a new era in web application security assessment, simplifying and enhancing the way professionals and enthusiasts safeguard digital assets.

1.4.2	Privacy Calculations	3
1.4.3	Final Deliverable of the Project	4
1.4.4	Benefits of the Project	4

1	LITERATURE REVIEW	3
2.1	Background	3
2.2	Problem Statement	3
2.3	Comparison Table	11
3	REQUIREMENT SPECIFICATIONS	17
	DECLARATION	ii
	APPROVAL FOR SUBMISSION	iii
	ACKNOWLEDGEMENTS	vi
	ABSTRACT	vii
	TABLE OF CONTENTS	viii
	LIST OF TABLES	xii
	LIST OF FIGURES	xiii
	LIST OF SYMBOLS / ABBREVIATIONS	xv
	LIST OF APPENDICES	xvi
	CHAPTER	
1	INTRODUCTION	1
1.1	Background	1
1.1.1	THE SIGNIFICANCE OF WEB APPLICATION SECURITY	1
1.1.2	THE ROLE OF PENETRATION TESTING	1
1.1.3	INTRODUCING SECURPROBE	2
1.2	Problem Statement	2
1.3	Aims and Objectives	2
1.4	Scope of Project	3
1.4.1	OUTCOME	3
1.4.2	Primary Outcomes:	3
1.4.3	Final Deliverable of the Project:	4
1.4.4	Benefits of the Project:	4

2	LITERATURE REVIEW	5
2.1	Background	5
2.2	Related Work	5
2.3	Comparison Table	11
3	REQUIREMENT SPECIFICATIONS	17
3.1	Traditional Penetration Testing	17
3.1.1	How Our System Differs	17
3.2	Proposed System	19
3.2.1	Overview	19
3.2.2	Key Features:	19
3.2.3	Benefits:	19
3.2.4	Target Users:	19
3.3	Requirement Specifications	20
3.3.1	Functional Requirements:	20
3.3.2	Non-Functional Requirements:	20
3.4	Use Cases	21
3.4.1	Use Case 1: Web Developer	21
3.4.2	Use Case 2: Security Analyst	21
4	DESIGN AND METHODOLOGY	22
4.1	PROPOSED	
	METHODOLOGY(FRAMEWORK/ARCHITECTURE)	22
4.1.1	Front-end Development:	22
4.1.2	Back-end Development:	22
4.2	ARCHITECTURE	23
4.2.1	Client-Side:	23
4.3	Security Measures:	24
4.4	PROCESS MODEL	24
4.5	MODULES DISCUSSION	25
4.5.1	RECONNAISSANCE:	25
4.5.2	WEB-BASED VULNERABILITIES:	26
4.5.3	VERSION-BASED VULNERABILITIES:	27

	4.5.4	Basic Overview	28
4.6		PROJECT SCHEDULE:	28
	4.6.1	KEY MILESTONES	28
	4.6.2	GANTT CHART	29
	4.6.3	SecurProbe Design	33
		SYSTEM IMPLEMENTATION	34
	5.1	Development Phases	34
	5.2	Technology Stack	34
	5.3	System Modules	35
	5.3.1	IPWHOIS:	35
	5.3.2	DIG tools:	35
	5.3.3	WAF scanner:	36
	5.3.4	Subdomain enumeration:	37
	5.3.5	SSL/TLS:	37
	5.3.6	Network scanner:	38
	5.3.7	DNS resolver:	38
	5.3.8	WordPress scanner:	39
	5.3.9	Web services:	39
6		SYSTEM TESTING AND EVALUATION	40
	6.1	Types of Testing	40
	6.1.1	Unit Testing:	40
	6.1.2	Integration Testing:	40
	6.1.3	System Testing:	40
	6.1.4	System Acceptance Testing (SAT):	40
	6.2	Unit Testing:	41
	6.2.1	Module 1: (ADV default tool)	41
	6.2.2	Module 2:(DNS resolver)	42
	6.2.3	Module 3: (Ip WhoIs)	43
	6.2.4	Module 4: (Network & Port Scanner)	44
	6.2.5	Module 5:(Password auditor)	45
	6.2.6	Module6:(SSL TLS finder)	46

6.2.7	Module7:(Sub domain)	47
6.2.8	Module 8:(WAF Detector)	48
6.2.9	Module 9:(Web services and web vulnerability finder)	49
6.2.10	Module 10:(Whois tool)	50
6.2.11	Module 11:(WP scan)	51
7	CONCLUSION	52
7.1	Summary	52
7.2	Future Work	52
	REFERENCES	53
	APPENDICES	55