SPECIMEN FORMAT FOR THESES OF MONTH

Faculty	:	Science
Department	:	Computer Science
Branch/ Area:	:	Computer science
Sub Subject Heading:	:	Cyber Security
Candidate's Name	:	M.Uma
Candidate's Address with email	:	H-359, Surya Apartments Ellisnagar Madurai -625010 uma.phdresearch@gmail.com
Title of the thesis	:	Enhanced Moving Target Defense Mechanisms to Handle Cyber Attacks
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Name of Supervisor	:	Dr.G.Padmavathi
Designation of Supervisor	:	Professor and Head
Centre/department/school in which research was conducted	:	|Department of Computer Science
University's Name & Address	:	Avinashilingam Institute for Home Science and Higher Education for Women (Deemed University)

Abstract within 300 words:

Secure communication in networking is still an open challenge due to the rapid development in technology. The increased use of networking makes the communication vulnerable to active and passive attacks. The decisive aim of the security is to maintain Confidentiality, Availability, Integrity, Non- repudiation and Authentication. According to a 2012 survey, that every organization is experiencing with an average of 102 attacks every week.

Based on the literature review, it is observed that efficient defense mechanisms are essential to defend against known and unknown cyber attacks. Game changing approaches are suggested as a defense mechanism to handle such attacks. The three game changing approaches namely, Trusted Tailored Spaces, Moving Target Defense Mechanisms and Cyber Economics are suggested as Research and Development Essentials. Among the three, moving target defense mechanisms are not explored much and only a few of them are used to handle attacks.

Moving target is a dynamic concept as it confuses the attackers by moving the real target often based on time or event. In the National Cyber Leap Year Summit Participants Report 2009, there are 11 moving target defense mechanisms suggested. According to the co-chairs' report, four moving target defense mechanisms are taken for study in this research work.

The objectives of the thesis are to Improve the quality of service in terms of End-to-end delay, Latency, Packet delivery ratio, Throughput, Reduce the number of retransmissions of data packets, Save time, Improve the accuracy of detection, Appropriate security application and Enhance storage security.

Few solutions are studied and enhanced. The proposed traffic monitoring technique achieves increased efficiency in traffic monitoring, adaptability for various network sizes, reduced retransmission and time saving. Cyber attack detection is done using the enhanced dimensionality reduction technique and the outcome is improved accuracy in detection of known cyber attacks. The percentage of detection rate is 94%

For unknown cyber attack detection, four moving target defense mechanisms are implemented and improvised. They are Smart Motion Adaptation/Management - Game Theory, Robust Cryptographic Authentication - Mouse Dynamics, Data Chunking and Decentralization and Decoys. The above moving target defense mechanisms are enhanced to achieve the objectives of the thesis.

The secured hash based game theory approach is proposed. The experimentation is conducted using the NS2 simulator and the performance is estimated in terms of reduced end to end delay, increased packet delivery ratio, throughput. The proposed method also ensures neighbor authentication. The cyber attack detection rate is 71%.

Enhanced mouse dynamics is another method which outperforms the existing method in terms of reduced authentication time, reduced false acceptance rate, reduced false rejection rate and increased accuracy in detection of unauthorized users. The detection accuracy is observed to be 73% .The proposed application is developed using JAVA 1.7 as front end and mysql as back end.

The improved data chunking using non-sequential storage has showed better performance than the existing method and it achieves development of an application, robust security and increased storage durability. It also achieves increased accuracy in detection of unknown cyber attacks. The percentage of detection rate is 79% when compared to Mark W. Storer method. The proposed application is developed using JAVA 1.7 as front end and mysql as back end.

The Integrated Time and Event Triggered approach is proposed and tested using Network Simulator NS2. Simulation results show that the proposed method performs better than the existing methods. The percentage of detection rate is 83% It also achieves reduced end to end delay, increased packet delivery ratio and improved throughput.

From the experimental and simulation results, it is observed that the four proposed methods are robust against known and unknown cyber attacks.

Examiners

Internal Examiner : **Dr. V. Rhymend Uthiriaraj**
Professor & Director
Ramanujam Computing Centre
Anna University, Chennai

External Examiner : **Dr. Kasi Periyasamy**
Dept. of Computer Science
University of Wisconsin –La Crosse
1725 State Street, LA Crosse, WI 54601, USA