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RESEARCH EXHIBITION IN MATHEMATICS & COMPUTER SCIENCES

# REMACS 5.0

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CS240 - BACHELOR OF INFORMATION TECHNOLOGY [HONS.]  
CS248 - BACHELOR OF SCIENCES [HONS.]  
MANAGEMENT IN MATHEMATICS  
CS251 - BACHELOR OF COMPUTER SCIENCE [HONS]  
NETCENTRIC COMPUTING  
CS255 - BACHELOR OF COMPUTER SCIENCE [HONS]  
DATA COMMUNICATION & NETWORKING

**2<sup>nd</sup> February 2023**  
**Stor Complex, UiTM Perlis**

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Organized by:  
College of Computing, Informatics and Media  
Universiti Teknologi MARA Perlis Branch

**Research Exhibition in Mathematics and Computer Sciences  
(REMACS 5.0)**

Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)

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# Preface

It is with great pleasure that we present this extended abstract book, titled "The 5<sup>th</sup> Research Exhibition in Mathematics and Computer Sciences (REMACS 5.0)". This book is a collection of research work in the fields of Computer Science and Mathematics, contributed by the final year students from Universiti Teknologi MARA, Perlis Branch. The aim of this book is to showcase the diversity and depth of research in these two interrelated fields.

Mathematics and Computer Science are two fields that have seen tremendous growth and advancement in recent years. With the rise of new technologies and the increasing demand for data-driven solutions, researchers in these fields have been working hard to develop new theories, algorithms, and models that can help solve some of the most pressing problems of our time. This book is a testament to their hard work and dedication.

The abstracts in this book cover a wide range of topics, including algebra, analysis, logic, computer architecture, algorithms, artificial intelligence, machine learning, computer network, netcentric computing and many more. The work presented here is both theoretical and practical, and has the potential to impact many areas of society, from finance and healthcare to education and security.

We hope that this book will serve as a valuable resource for future students in the fields of Mathematics and Computer Science. We also hope that it will inspire more students to pursue innovative and groundbreaking research in these two fields. Finally, we would like to express our gratitude to all the contributors for their hard work and dedication, without which this book would not have been possible.



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**REMACS 5.0**

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# EVENT SCHEDULE

8:00 – 8:30 am

- Registration

8:00 am – 12:00 pm

- FYP Project Presentation

12:00 - 2:00pm

- Lunch Break

2:15 – 2:35 pm

- National & Wawasan Setia Anthems
- Doa Recitation

2:35 – 2:45 pm

- Welcoming Address by Director of REMACS 5.0

2:45 – 2:55 pm

- Officiating & Closing Remarks from Rector of UiTM Perlis

2:55 – 3:00 pm

- REMACS 5.0 Montage

3:00 – 4:00 pm

- Awarding of Winners:
  - Best Poster
  - Best Project Award
- Photo Session
- End of Ceremony

*Dress Code: Formal / Corporate*

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# EXTENDED ABSTRACTS

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# PERFORMANCE ANALYSIS OF HTTP FLOODING ATTACK AT APPLICATION LAYER IN MOBILE AD-HOC NETWORK (MANET)

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## Abstract

HTTP flooding is a type of distributed denial of service attack that primarily affects the application layer. It was designed for the application layer which is the interface that interacts with the application directly and provides standard web application services. An association of mobile nodes known as a mobile ad hoc network (MANET) is each node communicates with the others by passing information to them. With the assistance of a botnet, the hacker sends a huge number of packets in the direction of the web server or application. The goal of this article is to analyse HTTP flooding attacks at the application layer in MANET as well as test and simulate HTTP flooding attacks in MANET utilising three factors, namely throughput, end-to-end delay, and packet delivery ratio. Using Network Simulator 2, the simulation will be in two scenarios, and it will differ by time and by number of nodes. This research concludes that the simulations of an HTTP flooding attack produce results as expected by the DDOS attack theory after performing all the simulations, gathering all the necessary data. The HTTP flooding attack affects network efficiency, regardless of how long it lasts or how many nodes are involved. End-to-end delay outperforms throughput and packet delivery ratio as performance indicators for both scenarios that differ in time and differ by number of nodes. If both the duration and the number of nodes rise, the consequence of an HTTP flooding attack will be more efficient and effective for DDOS attack.

**Keywords:** *HTTP flooding attack, MANET, Throughput, Packet Delivery Ratio, End-to-End Delay*

## 1. Introduction

The HTTP-flooding attack bombards the targeted web server with a large number of HTTP-GET and HTTP-POST request packets. The target system is unable to distinguish between malicious and normal request packets because malicious packets have authentic HTTP payloads, and the victim serves all regular and abnormal requests as legitimate requests. From that, the objectives of this article are to investigate HTTP flooding attack at application layer in MANET and also to test and simulate HTTP flooding attack in MANET using three parameters which is Throughput, Packet Delivery Ratio (PDR), and End to End Delay (EED).

## 2. Methodology

The simulation of an HTTP flooding attack will be split into two scenarios in order to produce a comparative study. The first scenario will involve 20 nodes and 1 victim in a MANET environment with different delay times of 10, 20, 30, 40, and 50 seconds. Second, while using two scenarios that have been compared and reviewed, the simulation will utilise constant duration, which is 50 seconds, but varies by node number, which is 5, 10, 15, 20, and 25. The data that have been collected after the process of simulation for the two scenarios will be filled into a table. The parameters used in this study include end-to-end delay, throughput, and packet delivery ratio.

## 3. Result and Discussion

For the simulations use the same number of nodes, which is 20 nodes, but differ by time, which is 10, 20, 30, 40, and 50 seconds. When the attack is launched, both throughput and packet delivery ratio are low because of the overload on the victim node, and total packet loss is higher than before the HTTP flooding attack was launched. In contrast to the end-to-end delay result, which is higher during the

attack than before the HTTP flooding attack, which was caused by the heavy traffic in the HTTP flooding attack simulation. Same goes to the simulation that uses a constant time which is 50 seconds but differs by number of nodes which is 5, 10, 15, 20, and 25 nodes. Due to the target node's overload, the attack's throughput and packet delivery ratio are low when it starts, and total packet loss is higher than it was before the start of the HTTP flooding assault. Lastly, the end-to-end delay result, which was brought on by the simulation's high traffic volume during the HTTP flooding assault, is greater during the attack than it was before the attack.

#### 4. Novelty of Research

There is some previous research that has been done on DDOS attacks on the MANET environment such as SYN Flooding Attack - Identification and Analysis by (K. Geetha and N. Sreenath, 2014). Another DDOS attack that can be related to the current study is about flooding attack which is Analysis of Effect of Flooding on Performance of Ad hoc Network which was done by (Dubey, 2016). There are also previous studies that do performance analysis on different routing protocols such as Performance Analysis of Different Routing Protocols in Manet Using Different Parameters in Different Ranges that have been done by (Neeraj et al., 2019).

#### 5. Conclusion

For scenarios that differ by timing, end-to-end delay gives the best result among other metrics of performance, which are throughput and packet delivery ratio. The same is true for scenarios that differ in the number of nodes; end-to-end delay demonstrates superior performance in terms of throughput and packet delivery ratio in terms of DDOS attacks. If both the times and the number of nodes increase, the result of an HTTP flooding attack will be more efficient and effective for DDOS attacks.

#### REFERENCE LIST

- Neeraj, K., Yedupati, K., Soumya, A. S., & Krishna, S. S. (2019). Performance analysis of different routing protocols in manet using different parameters in different ranges. *Proceedings of the International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud), I-SMAC 2018*, 713–718. <https://doi.org/10.1109/I-SMAC.2018.8653648>
- K. Geetha and N. Sreenath. (2014). *Syn Flooding Attack - Identification*. 978. <https://doi.org/10.1109/ICICES.2014.7033828>.
- Dubey, S. (2016). Analysis of Effect of Flooding on Performance of Ad hoc Network. *International Journal of Engineering And Computer Science*, 5(11), 19230–19236. <https://doi.org/10.18535/ijecs/v5i11.91>

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