Survey paper on PPDD: Protect Poor Clients in Rate-limiting-based DDoS Defence

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Abstract—Distributed Denial of Service (DDoS) attacks Internet-enabled applications and can break out privacy of any Internet service user. To control this attack, rate limiting is used. Rate-Limiting has their effectiveness in high-volume traffic. A portion of packets, most of which are vital requests, from valid clients may be dropped for no reason as such,as they are involved in the same formality of attack.This phenomenon is called poor client problem.To create a defensive-layer for these poor clients, this paper proposes a mutual-aid team system as a solution. Aadditional service is provided for poor clients via valid flow redirect. In core defence, the mutual-aid team system adopts rate-limiting-based solution to prevent the victim from being looted. Mutual-aid members help each other to forward valid flows to users. Compared with core defence,our team system increases the frequency of valid packets that achieve destinations successfully.We also discuss self-protection and fee-based service, which are strong economic and social encouragement for ISPs' innovations.Index TermsDDoS Defence, rate-limiting, poor client problem,redirection.

I.INTRODUCTION

Distributed Denial Of Service,the objective is the same as Denial Of Service--DOS attack (attempt to make the computer *victim* resources unavailable for valid users) but is accomplished by a lot of compromised hosts distributed over the Internet. Many Internet_based Services,such as e-business,social networking sites,etc suffer from the devastating impact of
the losses caused by the attack.Estimated loss faced by the service provides is in Millions of Dollars.Twitter server was recently down because of DDOS attack,resulting in server was flooded with 10TB of data per second resulting to slow down the site as purpose to bribery.A Hacker creates Zombies to flood the Poor Client with maximum requests possible to crash the client machine or server.

Considering serious impacts of such attacks,literature presents a great sequence of solutions to protect a vulnerable client from DDOS. In this approach Rate –limiting is widely used to defence the poor client from high-bandwidth DDOS.

The consequences faced by the Poor Client problem is because of the valid packets and infected packets cannot be distinguished.

Our goal is to protect the valid packets,as such legitimate requests passed by the Poor Client by using DDOS Defence based on Rate-Limiting.The valid packets are passed from one of the developer Defenceprotocol to another and eventually to the client.

Advantages :-

1. Forecasting under critical conditions and able to answer sensitive queries.

2. Data requirements are low to model and Easy what-if? Scenarios.

3. Low cost and an innovative approach

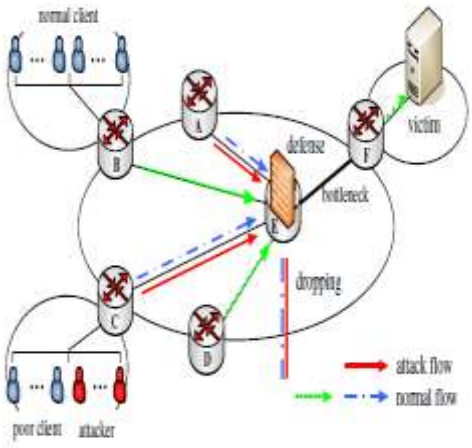

Fig. 1. The poor client problem

1.2Advantages:-

1.Forecasting under critical conditions and able to answer sensitive queries.

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II.Literature Survey

In this literature survey we are going to discuss some existing techniques for DDOS Defence.

A) Alisha Gupta~, B.B. Gupta,Department of Computer EngineeringNational Institute of Technology, India. Used the HONEYNETTRAP(frame work to detect and mitigate the DDOS using network of HONEYPOTS) HONEYPOTS are used for Network security and hence they are called as datasystem resource itsuncertified or un lawful use of its resources that is its value.

Drawbacks:-

1. HONEYPOTSposses open vulnerabilities and ports init to attract the attackers but if it is detected by attacker then itcan be used to launch further attacks that make it very seriousto use.
2. Large size of HONEYPOTS can cause memory overhead and
the large sized log files stored at it sometimes put a load on
the server.

B) Van Linh Nguyen, Po-Ching Lin, and Ren-Hung Hwang
we propose a novel MEC-based collaborative DDoS defence architecture for
mitigating the attack traffic burdens of ISP core networks. The performance shows that this MECPASS mechanism provides substantial benefits.The speed of mobility, the traffic model, the detection algorithm, and the synchronization between the local and central nodes are major concerns in designing a collaborative anti- DDoS system for mobile networks. In addition to traffic reduction at the edge, our architecture can
adopt any detection algorithm if the hardware or implementation is powerful enough to perform.

Drawbacks:-

1. Causes tedious network delays.
2. Wasteful expenditures of resources.
3. Excessive network footprints

III.Proposed Solutions

Valid Packets Selection:-

This is to determine if there is any poor client whose vital requests that needs to be protected, destination IP is required. There are two ways to protect such special consideration.
1. Active Registration:-
Active Registration keeps a list of important clients in the form of user IP address. IP address as IDs is acceptable. More details of the target and requests may expose personal information of clients. In practice, many companies have relatively fixed access requirement for servers, which is of the essential to their businesses. They pay for better service while in DDoS attack. Registering at the mutual-aid member, vital requests of these companies can be fairly sent to remote mutual-aid members, which redirects those requests to destinations.

2.Passive Evaluation*:*
Valid packetsshould also be protected from collateral damage even after using valid request flow.
An alternative approach is to let mutual-aidmembers validate clientsrequests. Since we do not assume all edge networks implementspoofed IP detection mechanism such as Incoming or

Outgoing filtering, we regard each source IP in the outgoing packets in the edge network.
Methods used to evaluate a client.
• Resident Source IP:-
If a source IP of an outgoing packet appears in the recent events, then the packet are generated by a resident and valid client. Given a referencewindow *W*, a bloom filter is used to record all source IP appear in *W*and each bucket counts the number of packetswhose source IP are mapped into it. A source IP is regarded as holder if all its corresponding buckets exceed *T*in last*W*.
• Regular Sending Rate:-
A client is valid if it sends requeststo the destination IP at a low rate. Let *x* be theaverage sending rate of a client. Client is valid if its current sending rate keeps lower than twice of *x*. In a bigDDoS attack, zombies usually multiply a huge amount of invalid packets to exhaust victim's resources. Theincreased sending rate may be double or triple of that in *x* time. Thereby we can distinguish betweenthe valid clientsand zombies by comparing their sending rates.

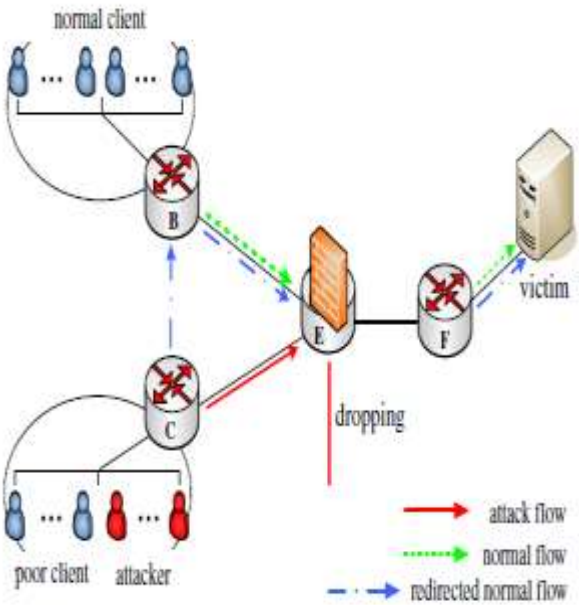

Fig. 3. Redirect valid flow

IV. Conclusion

In this paper, we describe the poor client problem that arises from rate-limiting-based DDoS defence and propose a novel mutual-aid team to tackle this common problem. By redirecting valid flow to several remote mutual-aid members, traffic from which are rate-limited, the mutual-aid team system can provide an additional opportunity for vital requests from poor clients achieving destinations. From this view, the proposed system is a necessary complement to current DDOS defence methods using aggregate-based rate limiting. Our simulation proves its feasibility and validity. The mutual-aid team system is designed for self-protection and as a fee-based service, thus ISPs have strong economic incentives to participate in the mutual-aid team

V. References

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