LINFO237 Project 2

Network attacks and protection

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Introduction

- Topology : reused from the homework with our modifications
- Attacks : scripts we made in Go (*v1.24.2*)
- Protection : nftables firewall

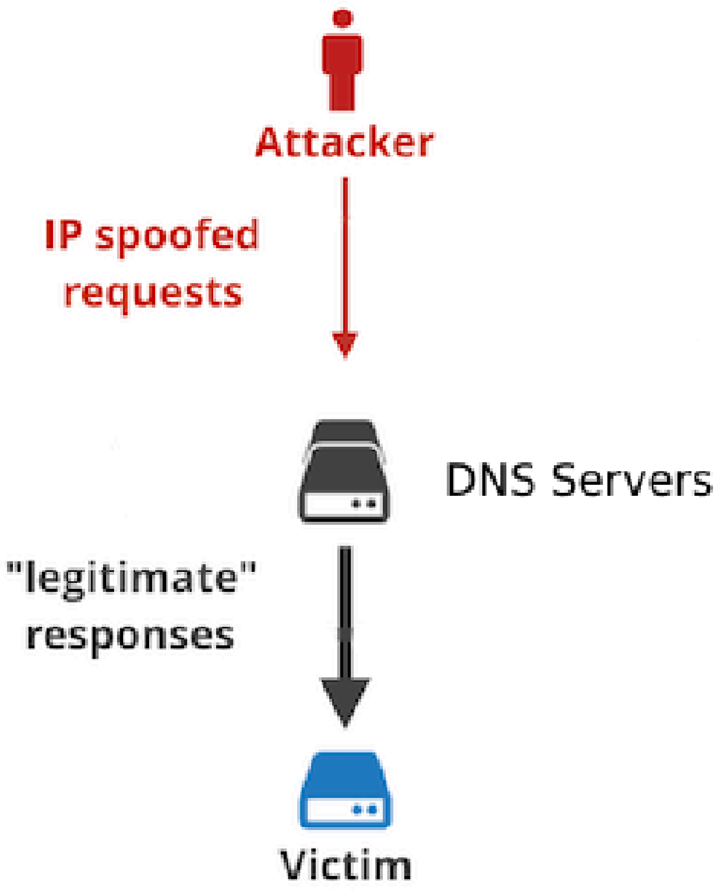
Reflected DoS

Attack

- run our script on a server which responds to the target

Protection

- Rate limit number of packets
- Blacklist IPs
- Drop packets of IPs in blacklist



SSH Brute Force

Attack

- Take a password list
- Launch the script which try every password (and none) to the target user
- Threaded option to speed up the attack

Protection

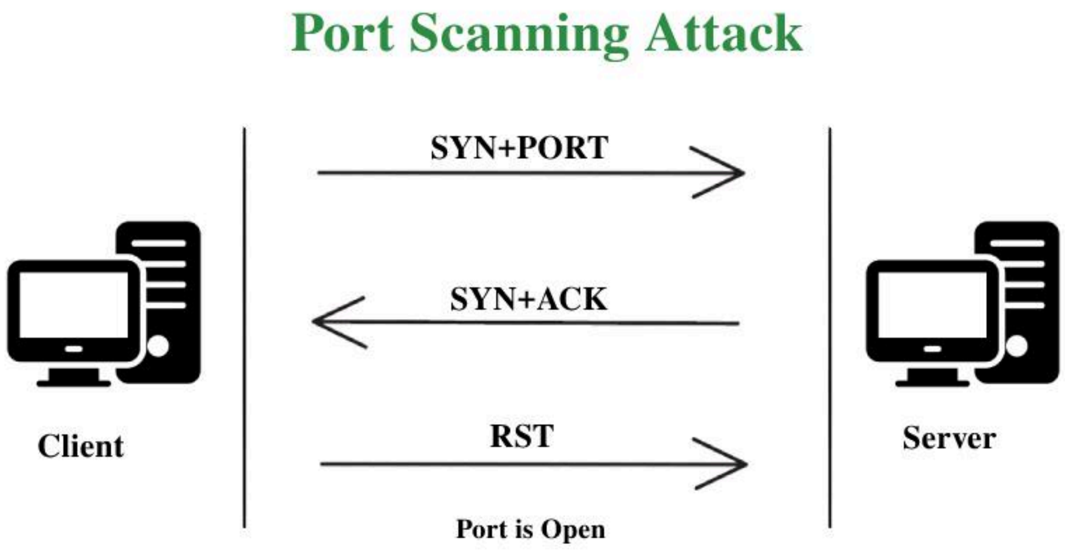
- Limit rate of new ssh connections (3/min)
- Optional : change the default ssh port in `/etc/ssh/sshd_config`
- Optional : allow only public key authentication (limit attack surface)

SYN scan

Attack

Protection

- Rate limit number of packets
- Blacklist IPs
- Drop packets of IPs in blacklist



SYN flood

Attack

- Build our own SYN packets with selected IPs and ports
- Flood the target with SYN packet and starve TCP connections
- Threaded option to accelerate starvation

Protection

- Rate limit number of new connections / SYN packets per second
- Blacklist IPs who exceed the limit
- Ensure SYN cookies are enabled

Improvements

Here are some ideas which could be implemented to improve the project

- Honeypot
  - SSH : create many fake users / root accounts, fake server
- Fail2ban : easier configuration

Conclusion

- Attacks are easy to implement, tools for real attacks even more effective
- Protection is crucial for services exposed and users safety

References

- https://media.geeksforgeeks.org/wp-content/uploads/20220906112959/white.jpg
- https://cf-assets.www.cloudflare.com/zkvhlag99gkb/37shntzMKVznz96CFNVl4n/c7d72b8761f9c5c89ef10a41cd3b398b/Untitled-2.001saaa.png (reworked)