MULTITHREAD, PROXY, BATCH, AND IMAGE-CLASSIFY: A MULTI-FEATURED APPROACH TO CRACK HTTP AUTHENTICATION

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Objective

Crack an HTTP authentication system by maximizing password spraying & CAPTCHA cracking speeds while avoiding getting blocked by the server.

Terminology

Password Spraying: A type of brute-force attack where a fixed set of passwords is brute-forced against a larger set of usernames.

Proxy: An intermediary server that forwards client requests and changes the client's IP address with the proxy server's.

EC2: A virtual server hosted on the Amazon Web Services (AWS).

Rate Limit: The number of allowed requests to the server per second.

Botnet: A collection of machines controlled by a single remote machine.

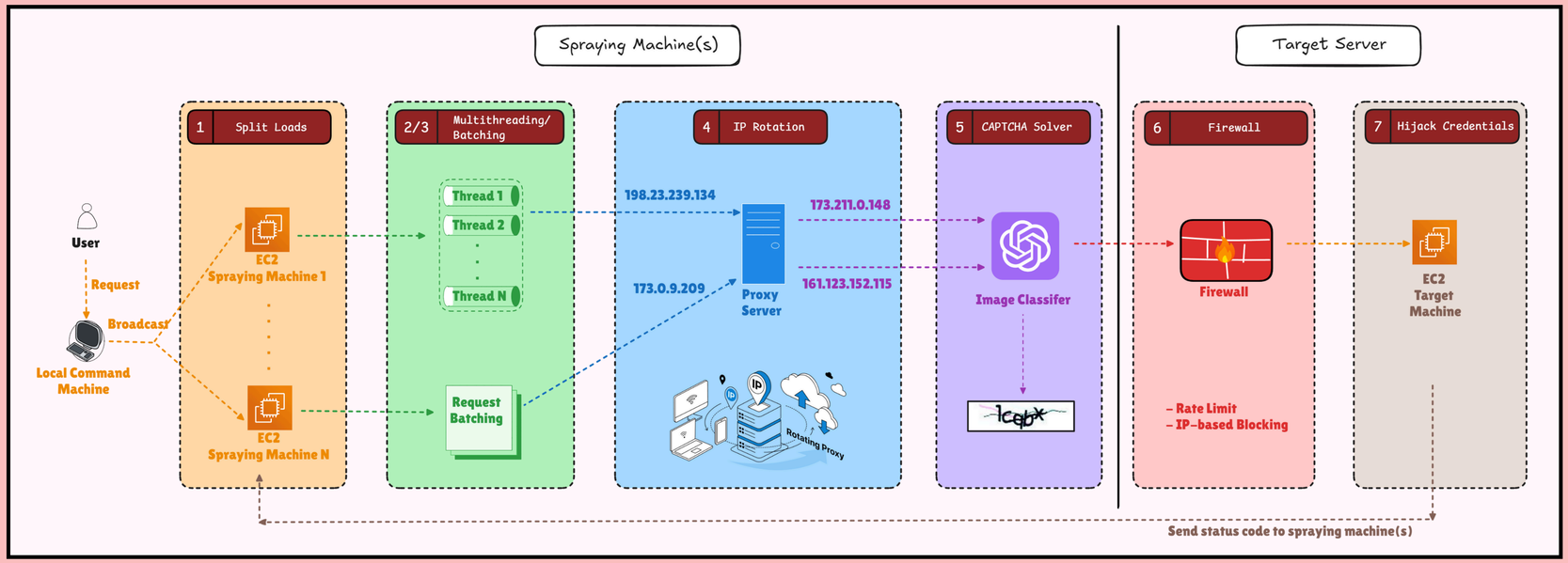
Setup

- 1 Target Machine hosted on an AWS EC2 Instance
  - (uses HTTP Auth and text-based CAPTCHA)
- 1 central command machine on Local Host
- 3 different spraying machines on 3 AWS EC2 instances

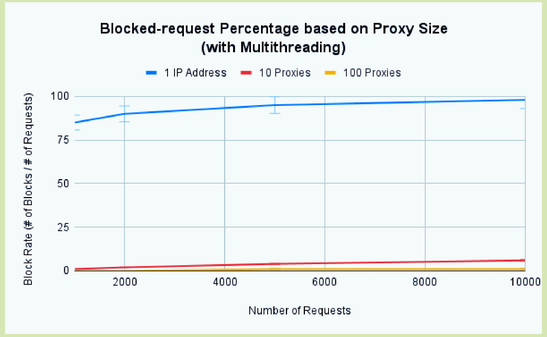
Features

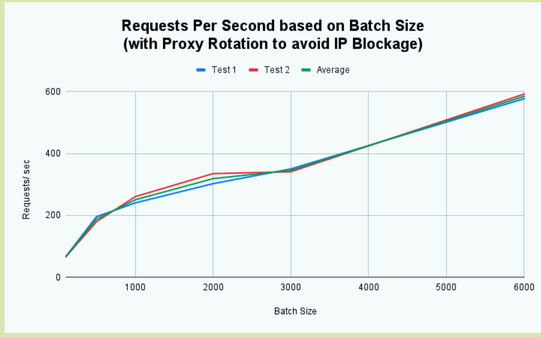
1) Scale with AWS EC2	Create multiple spraying machines, controlled by a local command machine, using EC2.
2) Multithread	Multithread to increase log-in request speed.
3) Batch + Synchronize	Instead of waiting for server responses after each request, send multiple requests in a batch and have a Synchronize function to collect all the responses at once.
4) Rotate IP	Rotate IP addresses constantly using proxies to avoid getting blocked.
5) Classify Images	Use a pre-trained OCR model to crack CAPTCHA texts.
6) Firewall	Implement server security using rate limiting and IP-address blocking.
7) Hijack credentials	After successful log-in, send cracked credentials from spray machine(s) to command machine.

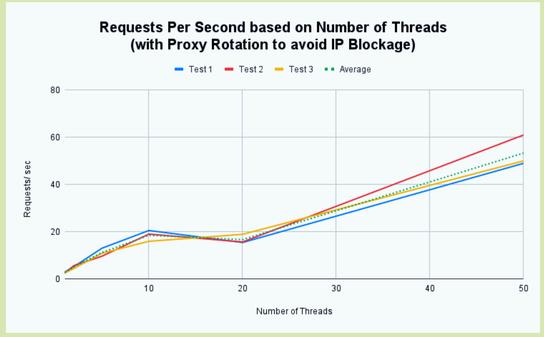
Attack Flowchart



Results







Future Work

Auto-Scaling and Load Balancing: Implement auto-scaling policies to create more spray machines when others go down + balance load across proxies and requests to maintain even distribution.

Dynamic adjustments with AI: Automatically tune rate limits, proxy selection, and batch sizes in real-time with AI based on features like response time, success rate, and server load.

CAPTCHA Expansion: Using other machine learning techniques, test and improve prediction accuracy for image-based CAPTCHA and re-CAPTCHA, the latest version from Google.

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References

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