Computer Networks Project

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1 Introduction

A proxy server is a server (a computer system or an application) that acts as an intermediary for requests from clients seeking resources from other servers.Today, most proxies are web proxies, facilitating access to content on the World Wide Web, providing anonymity and may be used to bypass IP address blocking.Proxy servers are used for several purposes. If it is used as a caching web proxy, it can dramatically improve performance of a web response.Proxy servers are also used as ”web proxies” to filter web page contents.An organization or company may use a proxy server to block offensive web contents from viewed by the users.

2 Goals

- Design a Proxy server to handle multiple clients on different machines.
- Server should handle HTTP GET, HEAD, POST and CONNECT requests and rejects all other types of request.
- Create an authorization channel providing access to only registered users.
- Block access to offensive web content for all users.
- Restrict the access of non super users to private official content.
- Obstruct unnecessary content by blocking unwanted Advertisements and promotional message sites.

3 Features

3.1 Authentication

Authentication based on Base64 encoding is used. A database containing clients credentials(username and password) is maintained which is used to authorize clients when a new client makes a session request.

3.2 Filtering of sites

We have filtered sites from user access in two level. First level consists of list of offensive sites which are needed to be blocked for every user. This list is common for every user. The second level of filtering of sites is user specific blocking of sites. Every user has list of sites corresponding to him/her which cannot be accessed by the respective person.After authentication, the server continues sending the request forward only if the queried hostname is not in the blocked list for that user. These user specific filtered urls are maintained in the same database which stores the client credentials.

3.3 Concurrent Requests

The server handles each request in a new forked thread. This enables the server to handle multiple requests at the same time. Each forked thread can return the response to the client without interrupting the parent thread.

3.4 AdBlocker

AdBlock allows users to prevent page elements, such as advertisements, from being displayed. The server blocks request for url which match with the list of advertisement sites present in the database.

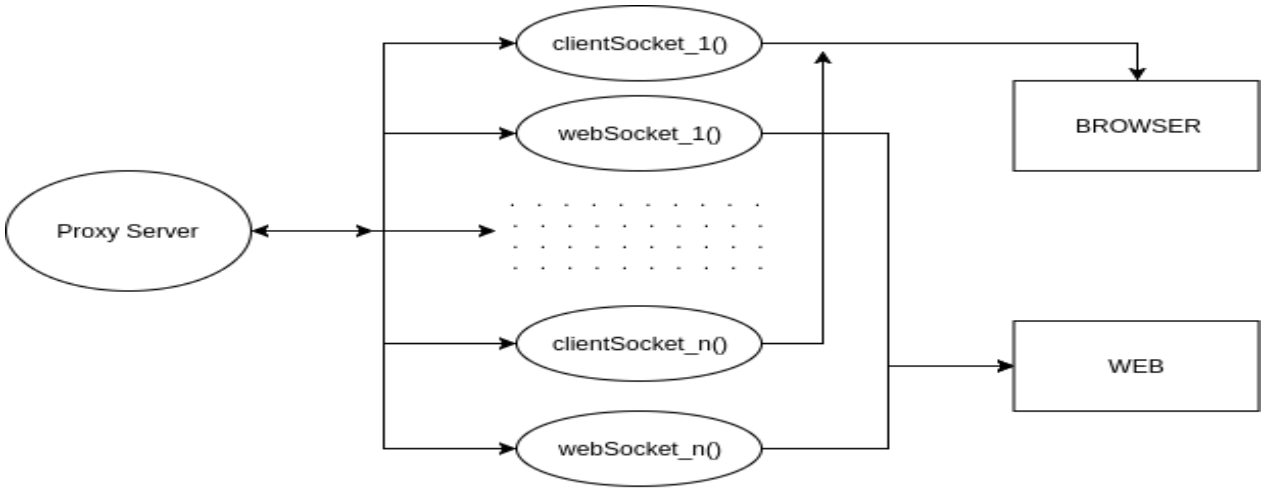
3.5 Error Handling

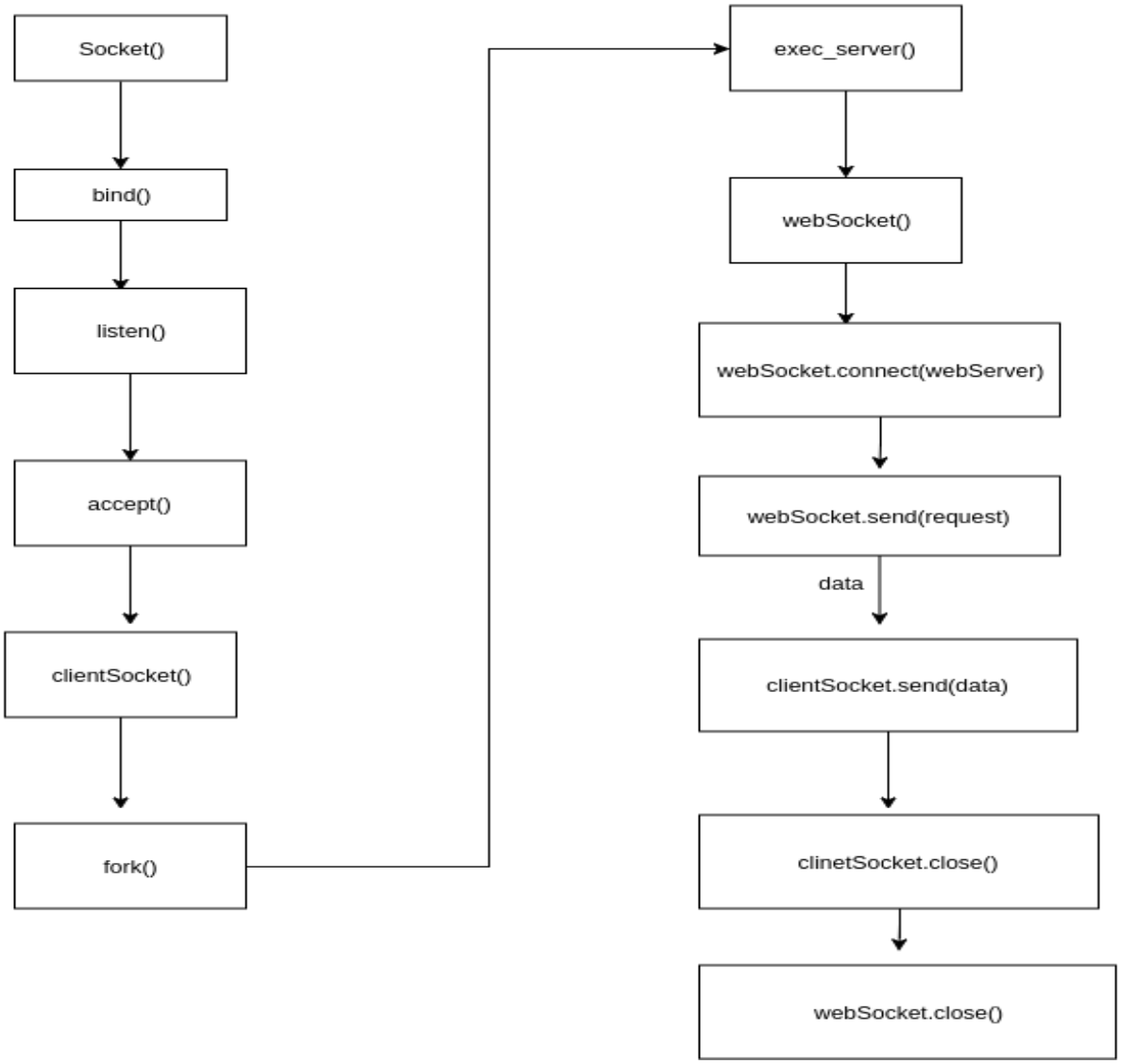
Appropriate error messages are thrown in case of authentication failure, invalid requests and invalid and filtered urls.

4 Assumption

- HTTPS protocol is not supported by the server.
- Port number in URL is not supported.

5 Implementation





6 Programming Language and Libraries Used

Proxy server was implemented on python using python libraries.The code is compatible with python3 and was successfully tested on Ubuntu 16.04(8 GB RAM).
Libraries that were used for the implementation are:

- **System Libraries :** os,sys,_thread, socket
- **Encoding Library :** base64
- **Feature Libraries :** argparse, time, adblockparser