

# Secure E-Voting System

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## Abstract

Secure E-Voting System is a python-based project. It is an efficient and financially savvy way of leading a democratic method, which has the characteristics of being large-scale data and real-time, as well as requiring a high level of security. Nonetheless, they are concerns about the security of systems administration and protection of correspondence for e-casting a ballot have been developed.

Here, the client establishes a connection with the server, this implies that the TCP protocol is being used. For each new arriving Client, the Server should create a new thread to accomplish this feature we took care of concurrent thread, that is, when the number of connections is made with the server, that time each thread doesn't interfere with one another. Therefore, we synchronized the threads. Securing e-casting a ballot is very urgent and has turned into a famous theme in correspondences and systems administration. This system puts a lot of trust in the central authority. It manages the security of information during the enrolment of the electors while surveying on the final voting day and then some and examining the votes to guarantee an impartial democratic climate. It additionally guarantees that the citizen is an enlisted and interesting elector who is qualified to cast a ballot and its polling form for casting a ballot is customized and gotten. The execution result shows that it is a practical and secure e-casting ballot framework, which takes care of the issue of falsification of votes during e-casting a ballot.

## 1. INTRODUCTION

Voting is a method to settle on an aggregate opinion among a group or a meeting or electorates. Casting a ballot is normally following discussions, conversations, and political races. During casting a ballot, the individual to be chosen is the applicant

of a political race, and the individual who casts a ballot for their chosen candidate is a voter. Usually, the voter can vote following the list of candidates or vote for any other persons he/her prefers. Casting a ballot voting form should be unsigned and set apart by the electors in private booths with the goal that no other person can find out for whom a person is voting. Since the seventeenth century, casting a ballot has been the typical system by which present-day delegates a majority rules government has worked. Likewise, voting is utilized in numerous other private associations and gatherings, like clubs, corporations, organizations, and deliberate affiliations.

Many old offline services, including voting, mail, payment, and installment, are migrating to digital websites due to improvements on the Internet, information technologies, and data breakthroughs developed. E-voting is another name for online voting (e-casting a ballot). It's an electronic voting system that allows you to cast and count your votes. Users of e-casting a ballot are citizens and political race specialists i.e., election authorities. The citizen can give his/her votes electronically to the political party's specialists from any area through e-voting. The election authorities are answerable for gathering votes from electors. E-casting a ballot can save time and effort with high proficiency and adaptability, which is getting more and more attention instead of the conventional way of voting. With the advancement of the Internet, e-voting turned into a significant method for some organizations.

Casting a ballot cycle is significant in any part of the world in public elections, private or independent bodies for choosing somebody. Due to the current pandemic situation, it is difficult to organize elections physically soon. Electronic voting (E-casting a ballot) is an option for getting sorted out by casting a ballot online through which an elector can make their choice remotely from any

side of the world through PC or mobile. Electronic voting is a moving assignment to guarantee to cast a ballot prerequisite like eligibility, Accuracy, Simplicity, robustness, security, and dependability of the client and the framework. In Electronic voting to empower remote voting, all the political information and its application modules should be put in the Cloud framework, and it should be completely secure that unauthorized persons cannot access it. With the increase in usage of cloud computing services, data security and integrity are a major concern among various organizations. The purpose of the research here is to ensure security and reliability using Crypt DB in the Electronic voting process. In the proposed online electronic voting system, voters' data, Candidate data, and votes triggered by voters are stored in an encrypted database called Crypt DB. Crypt DB is already proven as a secure database that encrypts the data before storing them in the database and it follows multiple levels of encryption. The proposed systems do not reveal any information to the intruders at any level of the polling system and hence the outcome of the Voting process can be achieved using the online system with Security, Confidentiality, and integrity.

## 2. MOTIVATIONS

A few weeks ago, there was an election in the five states of India. Among these five states one state is where I live in i.e., U.P. So, when I have gone to the polling booth to vote that day, I have seen an excessively big queue and, in this pandemic, we should follow the covid protocol but due to heavy rush no one was even trying to follow the covid protocol which seems to be dangerous and even worried about the future covid waves. Apart from these, standing in a big queue and voting is a bit time-consuming in this fast-moving world, so E-voting can help people save time.

E-casting a ballot is a proficient and financially savvy way of conducting a voting procedure, which has the characteristic of being generous information and mentioning high security. In any case, worry about the security of the Internet and the protection of correspondence have been developed. Secrecy required by e-casting a ballot cannot meet by encryption alone. For instance, a vote ought not to be recognizable back to the elector in e-casting a ballot. E-casting a ballot

utilizes PCs, and cryptography with the fundamental of encryption and signature algorithms. Instruction to plan a safer and more practical e-casting ballot framework has turned into a well-known topic in the industry and data security. To work on the security and secrecy of e-casting a ballot, we present methods to construct e-voting systems.

## 3. PROJECT DESCRIPTION

The important objective of this paper is to develop an online secure E-voting system which is a need these days. The web-based framework ought to fulfill the essential prerequisites like the product utilized ought to be relied upon should be trusted and secure. This is an automated system. It will be a secure framework because the client can cast a vote only once as the database will not accept more than one vote for every user as everyone eligible to cast a vote had their information in the database. This system should have large database support. This online voting system is extremely easy to use and very efficient. This system does not require much effort as compared to the normal voting system. Once the system is understandable to everyone then this will be the best form to vote. Across all these features it also has some drawbacks like software issues, internet problems, etc.

## 4. SOFTWARE DESIGN

- I. A secure server that only allows clients with authentic names and passwords to cast votes.
- II. Server checks for the authenticity of the client & also checks if the client has already voted. It returns a message to the client according to the security check.
- III. Voters are registered by admin and the voter's list is stored in a CSV file.
- IV. Server can take the client's name and password and match it with the txt file.
- V. If details match, then the voter is redirected to the secured Voting pages.
- VI. The voters will then cast the vote by mentioning the poll symbol of the candidate from the candidate list provided by the server.

**VII.** The system (server) can handle multiple clients and creates a new thread for each of them.

**VIII.** One client can cast a vote once and only once.

➤ Protocol: TCP

➤ User Interface: python-Tkinter

➤ Data Storage: Using CSV files

➤ Data Updates: python-pandas

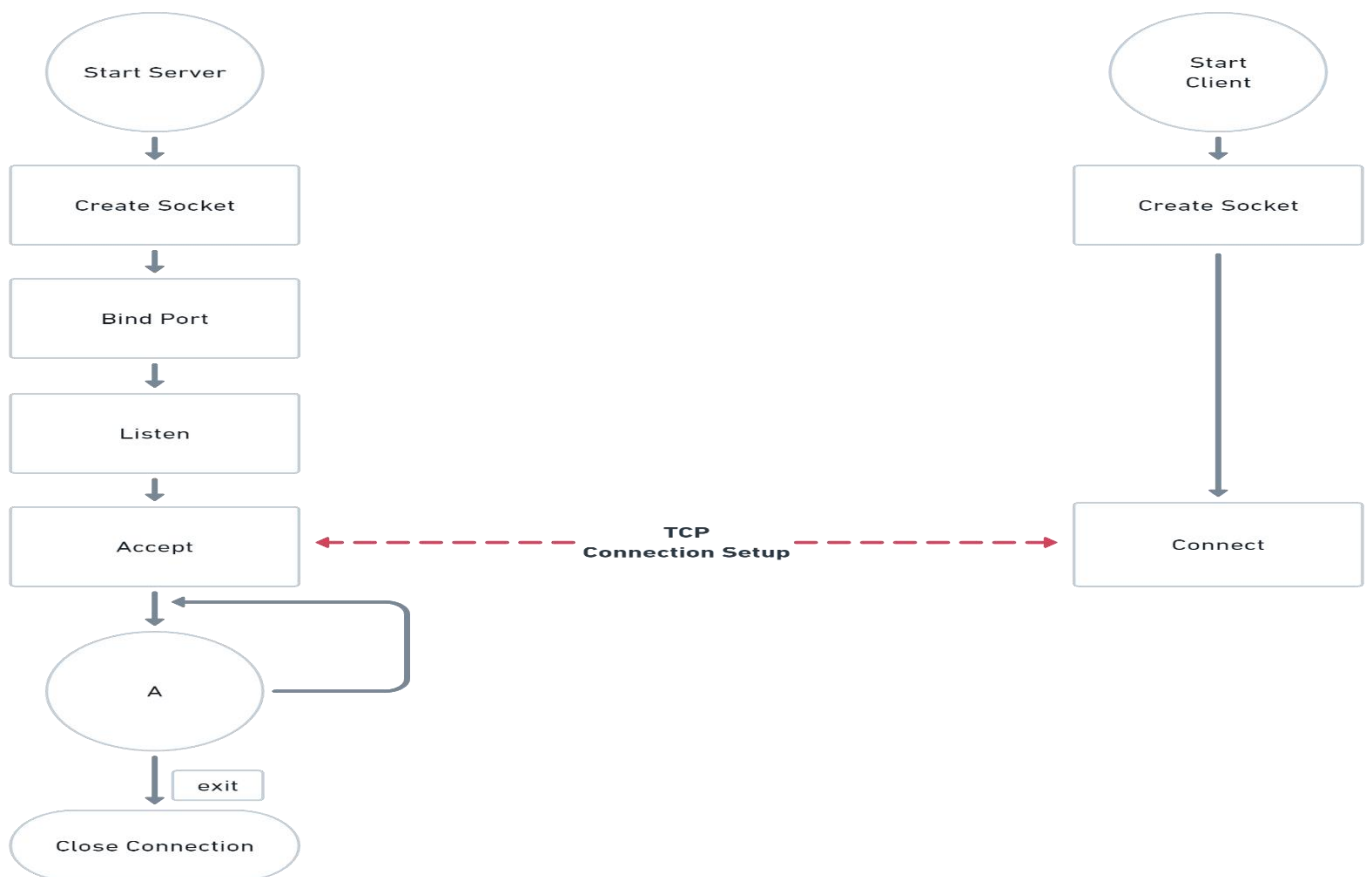
➤ OS Calls: python-subprocess

## 5. TOOLS USED

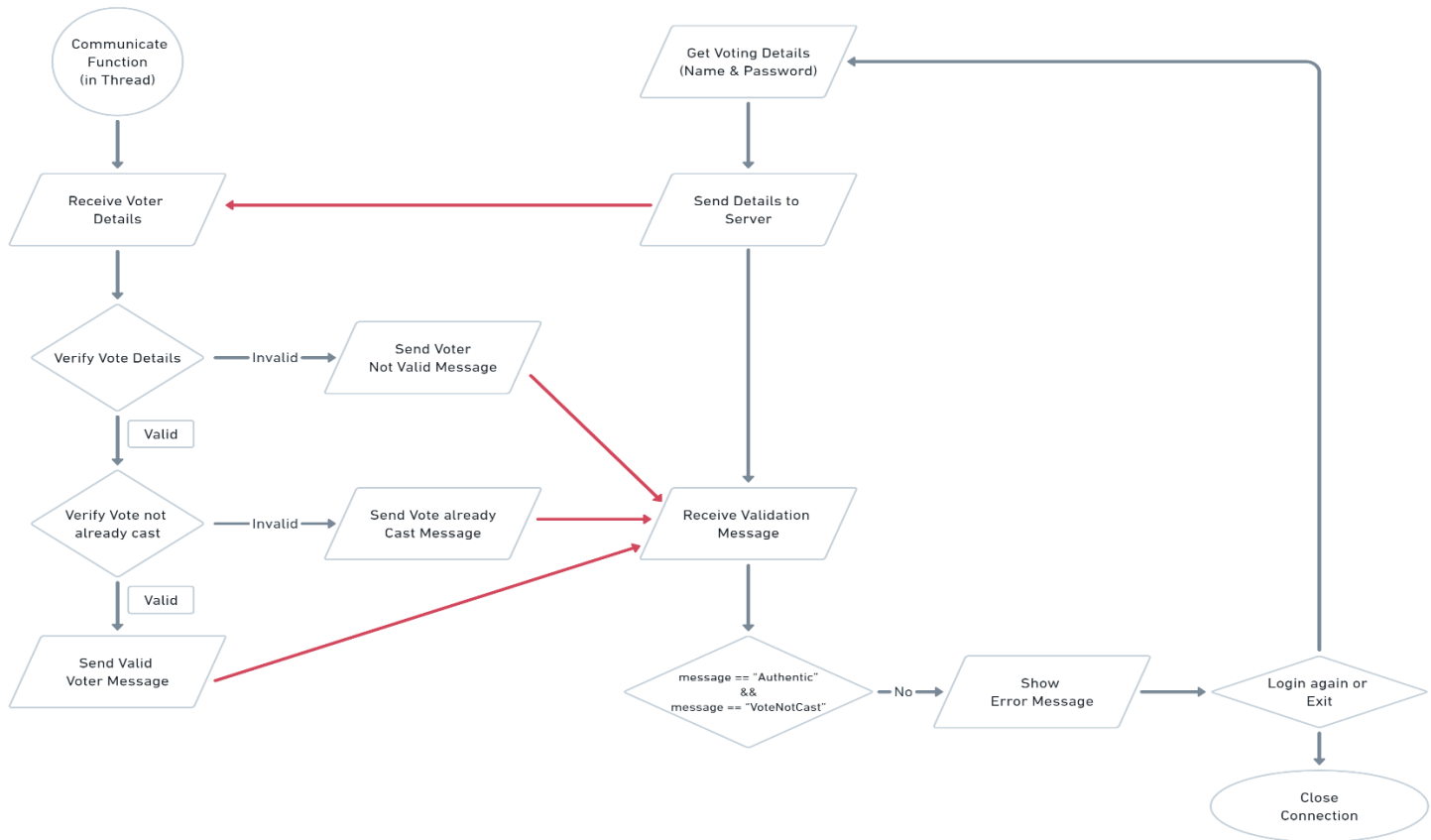
➤ Programming: Python

➤ Connection: Socket Programming

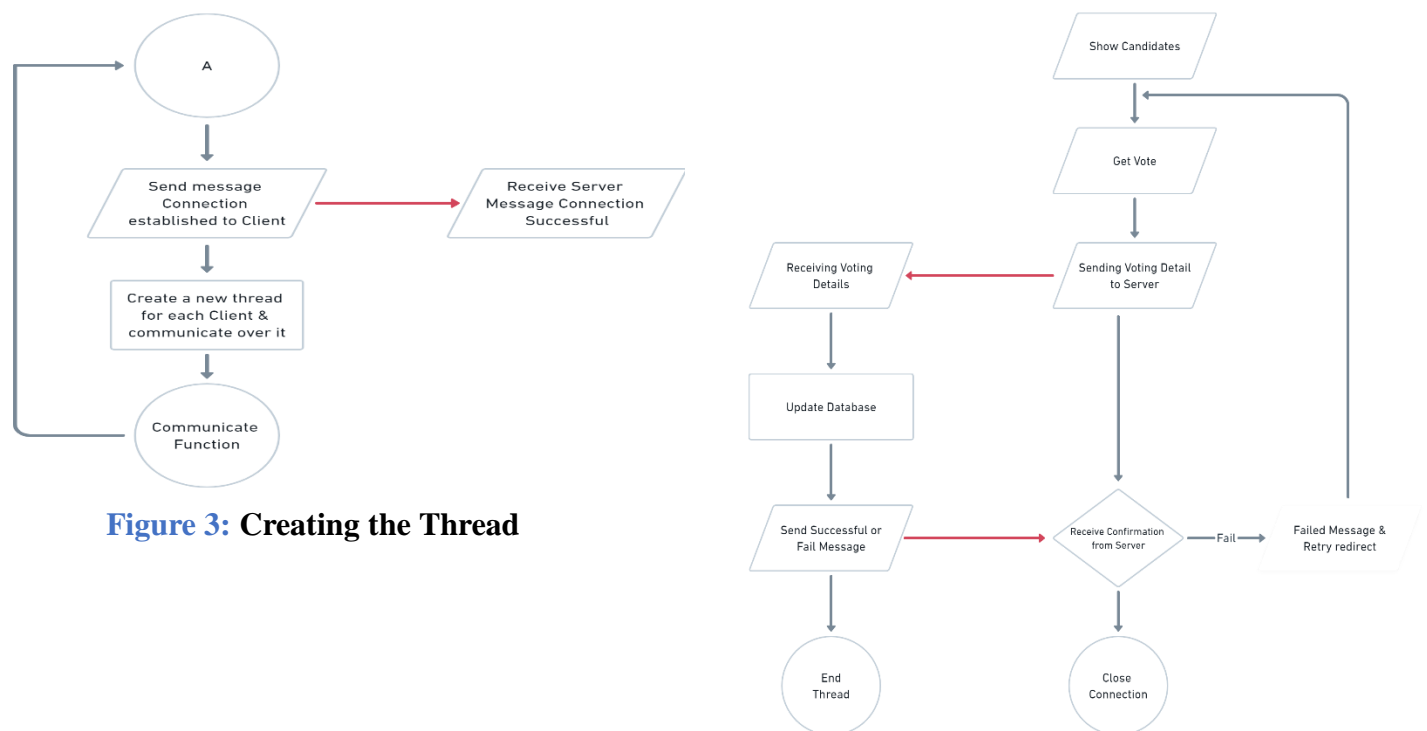
## 6. FLOWCHART



**Figure 1: Starting and Creating the Server**



**Figure 2: Casting the Vote**



**Figure 3: Creating the Thread**

**Figure 4: Closing the thread and Server**

## 7. IMPORTANT MODULES

- I. CLIENT MODULE** – It includes a login name and a specific secret word that he or she can use to access the web-based voting system. The admin will deliver this to the client. After the client has successfully signed in, he will be able to see the names of the candidates who have been recorded by the administrator, as well as the results after the vote has been cast.
- II. ADMIN LOGIN** – It comprises a login name and password of the admin through which the system will be connected to the server and further processes will be executed such as registration of the new user and creating multiple home page windows.
- III. USER LOGIN** – Every voter is furnished with one of a kind username and secret key i.e., password physically by the Admin. The voter utilizes the username and secret key for login and exercises the crucial right of casting a ballot. If the mistaken username and the secret word are entered, the message of the invalid user will be given on the screen.
- IV. VOTE** – This gives the voter a rundown of hopefuls within his/her body electorate alongside determination choice to choose the favored competitor from the list which is stored by the admin who is competing in the election and after the successful voting user will even get the confirmation.
- V. VOTER LIST** – Here we can see the voters list. Every voter will have a separate voter ID and password. It comprises with few more details like gender, city, zone, and whether he/she has cast the vote or not.
- VI. CANDIDATE LIST** – The rundown of competitors partaking in the race can be seen. It incorporates the competitor's name, party names, and gathering image along with vote count.

## 8. PROJECT RESULTS

- I.** Open the project and run the homePage.py file to open Home Page Window.
- II.** Log into Admin and press 'Run Server'. This will run the Server in a new console window.
- III.** Now that the server is running, return to the admin home page window.
- IV.** Press 'Register Voter' and enter details to register a new voter. Remember or note down the 'Voter ID' that you will receive on successful registration.
- V.** Press 'Home' to return to the Home. Now, press 'Voter Login' to open the voter login page.
- VI.** Enter the login details and you are redirected to the Voting Page. You will receive an error message if the Voter is invalid or has already cast a vote.
- VII.** Cast a Vote. Now on receiving a success message, press home to return home.
- VIII.** Login into Admin again. Press 'Show Votes' to check the votes that all parties have received so far.
- IX.** Return Home. You can press 'New Window' to open multiple pages and cast a vote concurrently from multiple voters.

## 9. DISCUSSIONS

By doing this undertaking I could bring another framework for online national voting in favor of our nation with some more security of cryptography algorithms such as SHAKE-256. With the incoming innovation and the Internet in our everyday life, we could offer propelled casting a ballot framework to voters both in the nation and outside through our web-based casting a ballot framework.

## 10. CONCLUSION

We learned how to implement TCP socket programming using Python from the 'E-voting system' project. We also learned how to connect multiple clients with one server. As the requirement of the project was to allocate a new thread by the server for every new incoming Client thus, to accomplish this requirement we learned how to implement synchronized multithreading in



python and implemented it in the code of socket programming.

The Online Voting Platform offers clever tickets, brilliant agenda highlights, vote counting, classification, and revealing. These capacities are programmed and don't should be doled out to faculty in-house. Furthermore, it enables heads to make decisions on polls with the goal that voters can't cast invalid votes, nor do they should be checked while tallying. The Online Voting Platform offers the least demanding and most helpful technique for directors and voters alike. For directors, the way toward setting up a ticket and leading a decision is basic and sensible.

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