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E-VOTING SYSTEM USING MULTI-TENANT BASED MOBILE CLOUD

M.S.Saravanan*, M.F. Timna Sandrine
Professor, Department ofCSE & IT, Saveetha School of Engineering, Saveetha University, Chennai, India.
IIIT, Department of Information Technology, Saveetha School of Engineering, Saveetha University, Chennai, India.
Email: saranenadu@gmail.com

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Abstract

The e-Voting is a process of manipulating the voting process in election instead of using an electronic voting machine. In this paper we described that how the android mobile phones are useful for e-Voting with a physical server. The android platform is easy to understand the development of mobile processes of any individual. Hence the central database of election commission can be easily connected to the mobile network. A voter need to register on election commission database only once during the life time of his / her beneficiary. Hence in this paper we propose a new e-Voting framework with Multi-Tenant Approach using Mobile Cloud. This Multi-Tenant ensure the database connection whenever required to build the connection with the voter for any online services such as correction and modification of address or phone number or e-mail like personal credentials.

Keywords: Android, e-voting system, election committee, web services.

1. Introduction

An electronic voting system is a voting system in which the election data is recorded, stored and processed primarily as digital information. There are two types of e-Voting, they are online and offline, for example data that can access via Internet is online, and by using a voting machine or an electronic polling booth is offline. Authentication of Voters, Security of voting process, Securing voted data are the main challenge of e-voting. This is the reason why designing a secure e-voting system is very important. The security of the system relies mainly on the black box voting machine. But security of data, privacy of the voters and the accuracy of the vote are also main aspects that have to be taken into consideration while building secure e-Voting system. In this paper the authenticating voters and polling data security aspects for e-voting systems was discussed. It ensures that voting cannot be altered by unauthorized person. The voter authentication in online e-Voting process can be done by formal registration through administrators and by entering Global System for Mobile Communications (GSM). In offline e-voting process

authentication can be done using facial reorganization, thumb impression sensing and Radio Frequency Identification (RFID) smart cards, which enables the electronic ballot, reset for allowing voters to poll their votes. Also the voted data and voters details can be sent to the nearby Database Administration unit in a timely manner using GSM System with cryptography technique. Electronic elections are conducted either using Direct Recording Electronic (DRE) machines or over the Internet. They are an electronic implementation of the old mechanical lever machine. Further, if a malfunction is detected, there seems no way to conduct a recount and the only remedy is a recast of ballots. Internet voting provides easy way of access and eliminates absentee ballots, but is surrounded by many more security concerns than the DRE systems. While the penetration of modern technology has advanced, the knowledge on how to use it has not advanced at the same place. In order for e-Voting to work you would need to have people IT-literate enough to use a government-issued certificate to authenticate themselves and in general to use computers.This challenge will automatically be resolved over time, but at the moment, especially in ageing societies of the western hemisphere this is not a given fact [1].

Actually, "computerized voting machines" is a bad choice. Many of today's voting technologies involve computers. Computers tabulate both punch-card and optical-scan machines. The current debate centres around all-computer voting systems, primarily touch-screen systems, called Direct Record Electronic (DRE) machines. (The voting system used in India's most recent election - a computer with a series of buttons - is subject to the same issues.) In these systems the voter is presented with a list of choices on a screen, perhaps multiple screens if there are multiple elections, and he indicates his choice by touching the screen [2]. These machines are easy to use, produce immediately after the polls close, and can handle very complicated elections.

2. The impact of Mobile Cloud on e-Voting

The mobile cloud is Internet-based data, applications and related services accessed through smartphones, laptop computers, tablets and other portable devices. Mobile cloud computing is differentiated from mobile computing in general because the devices run cloud-based. Mobile cloud application and mobile web apps are similar [3]. They both run on serves external to the mobile device, they both store data externally and they are both accessed over the internet with a browser. However, it is often said that while all cloud application are web application not all web application are cloud application. Simply not all mobile webs application can run in a virtual environment without being re-engineered.

This is because a web app may originally been written to run and store data on a dedicated physical server in a data centre [4]. A cloud app will always be written to live on virtual servers in a distributed, Multi-Tenant architecture and store data in the cloud. Mobile cloud and web application are both very different from native mobile application. Native apps in mobile software development run on one particular mobile device and are downloaded and installed on the mobile device [5]. The challenge of writing native mobile application is that developers must create three different versions of the same mobile application, if they want it to be used by IOS, android and windows devices. Because mobile cloud application are not downloaded, the developers can just write one version of their mobile application and any device with a browser and internet connection can use it [6].

The cloud on the other hand has virtually limitless storage [7]. Whether we UseBox, or Dropbox, or SkyDrive, or Google Drive, you can add gigabytes or even terabytes of data that are accessible from your mobile devices as long as you have a Wi-Fi or cellular signal to connect to the cloud. The significant benefits for using cloud storage with a mobile device, in the event that your mobile device is lost or stolen, your data is still safe and accessible [8].

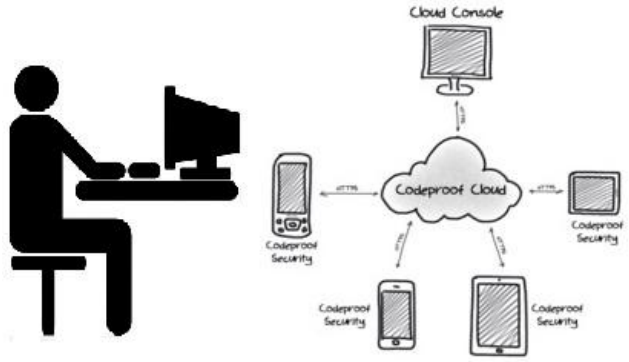

Figure 1. Data Communication between Mobile and Server Administrator.

In the above figure, we enroll on the codeproof platform by installing codeproof security agent application on each smartphone and tablet, including iPhone and iPad. Then the codeproof security agent will communicate withcodeproof cloud, securely over Secure Sockets Layer (SSL). Once the device enrolment is completed a device node will appear automatically in the codeproof cloud console directory tree. Next, the codeproof cloud will push optical password restriction policies to the device to make sure that the device is protected.

3. Multi-Tenant Architecture for Mobile Cloud

Multi-Tenancy is the fundamental technology that cloud use to share information technology(IT) resources such as cost-efficiency and security. Just like a bank in which many tenants cost-efficiency share a hidden, common infrastructure, yet utilize a defined set of highly secure services, with complete privacy from other tenants. A cloud

uses multi-tenancy technology to share ITresources securely among multiple applications and tenants(businesses, organizations, etc.) that use the cloud. Some clouds use virtualization-based architectures to isolate tenants; others use custom software architectures to get the job done. Multi-tenancy is economical, because software development and maintenance costs are shared. It can be different with single-tenancy, an architecture in which each customer has theirown software instance and may be given access to code. With a multi-tenancy architecture, the provider only has to make updates once. With single-tenancy architecture, the provider has to touch multiple instances of the software in order to make updates. In cloud computing the meaning of multi-tenancy architecture has extensive because of new service model that take advantage of visualization and remote access.

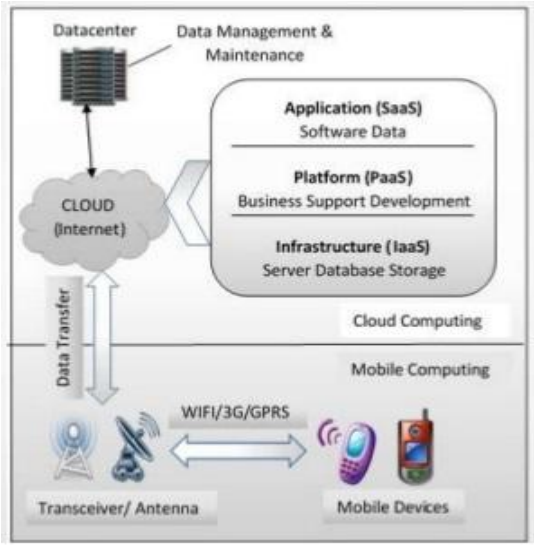

Figure 2. **Multi-Tenant Users Connection with Mobile Cloud.**

From the above figure, The architectureof mobile cloud computing the antenna receives the signal from the mobile devices and now the data is transferto the cloud and the SaaS (Software as Service) and the IaaS (Infrastructure as Service) application moves to the cloud and manages through data centre.

4. A new Framework for e-Voting using Multi-Tenant based Mobile Cloud

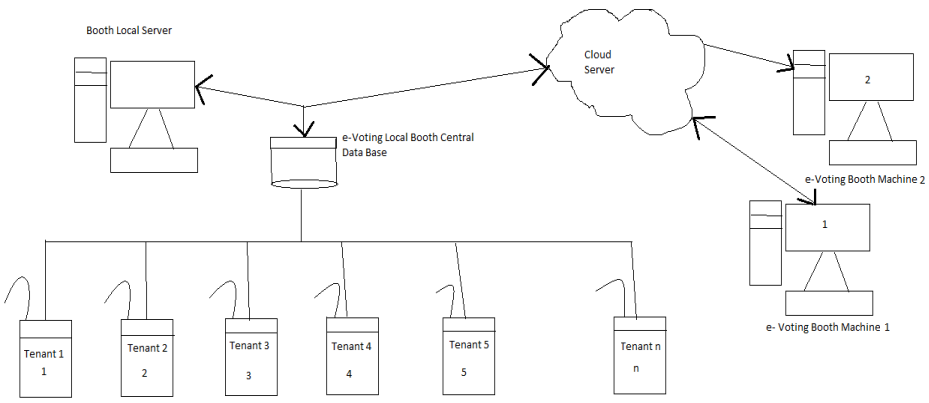

Figure 3. **Architectural Overview of Multi-Tenancy.**

The paper will propose an electronic voting system which will include the following stages: Voter list creation, List announcement, Registration, Authentication, Voting, Counting or tallying and Result announcement. The proposed system is described in figure 3. After the system is implemented, it will be formally analysed using formal specification language mCRL2 in order to prove its security. Figure 3 describes the proposed system architecture. The first step in voting process is collecting census. In the proposed system, the data of a tenant from a public booth is collected for electing the pilot among nominated candidates. The voter list and the pseudo ID of legitimate votersare stored in a database for use in checking verification. After completing the voter list creation, the eligible voter list is announced. This step is done by the administrator the voter request for voting. Thus the voting process is carried out.

5. Conclusion

This paper depicits the new model of e-Voting System using cloud in Multi-tenant Based Mobile Cloud. The preferred model is more secure and efficient than the Conventional voting system. The e-Voting system avoids the delay of result it is capable to count all votes within few times. A unique AADHAAR identification number is the base point of this model. This model easily verifies to the voter and elector. In this paper we have endeavour to make more secure e-Voting and it avoids unauthorized access. The model of e-Voting System using cloud will enhance the transparency and reliability of the current electoral system.

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