AN AUTONOMIC CLOUD ENVIRONMENT FOR HOSTING E-VOTING FOR CORPORATE INSTITUTIONS

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ABSTRACT

The use of new technologies to support voting has been and is the subject of great debate. The word "vote" means to choose from a list, to elect or to determine. The main goal of voting (in a scenario involving the citizens of a given country) is to come up with leaders of the people's choice. Several people advocate the benefits it can bring—such as improved speed and accuracy in counting, accessibility, voting from home, etc. As many are concerned with the risks it poses, such as unequal access (digital divide), violation to secrecy and anonymity, alteration of the results of an election (because of malicious attacks, bad design/coding, or Procedural weaknesses). As in the case of corporate world, we have proposed the development of an autonomic system which helps in the conduction of the transparent voting process for the corporate companies. All the verification process, counting of votes and declaration of results will be automatic. Thus, creating a self- sufficient and secured system with the help of NFC. Further, this system will also provide a platform for rating of the products in the form of 'likes'. This will help in planning the product release and also help in predicting the market trends so that the maximum product sales can be achieved.

Keywords :- *E-voting, NFC(Near Field Communication), Cloud computing, Mobile cloud computing, Smartphones, Android OS, Corporate Institutions, Business Intelligence, Privacy-Preserving, Cost Benefit Analysis, Legal Infrastructure, Information Security, Jurisdiction, Trust, Internet Election, Internet Voting, Accountability, Verifiability, Security requirements, Security threats, Security Assessment.*

1. Introduction

Cloud computing promises reliable services delivered through next-generation data centers that are built on compute and storage virtualization technologies. Users will be able to access applications and data from a ''Cloud'' anywhere in the world on demand. In other words, the Cloud appears to be a single point of access for all the computing, networking, and storage needs of users. The users are assured that the Cloud infrastructure is robust and will always be available at any time. With the rapid emergence of software systems and their applicability, the volume of users are growing exponentially. User requirements are getting more and more complex. Existing computing infrastructure, software system designs, and use cases will have to take into account the enormity in volume of requests, size of data, computing load, locality and type of users, and so forth, in order to provide a usable services to the end-users. As India is the largest democratic in the world, the statistics show that the percentage of polling on the day of elections is not satisfactory as majority of people are not coming to vote and think that it is under the supervision of the corrupt officials. The manual voting system takes long time as there is a lot of paper work first and then human effort is also there for counting of the votes. Manual voting consumes almost 4-6 hours (approx.) of every voter which is surely a tiring process. In case of elections in the corporate companies, the employees will be given impartial environment to cast the ballot. The voting for the corporate companies will be done online through an android application such that there is no need to reach the election place at the time of voting and the employees can vote from the home or from any other place. A USER ID and PASSWORD will be provided

to every employee of the corporate companies, so that on the time of elections they can easily login on the "evoting app" on their smartphones and can cast his/her vote. The authentication is provided with the use of NFC, making the app cost- effective. Special arrangements will be done in order to maintain the integrity of the ballot. Further, votes in the form likes will be done by the customers on the various products of the company which will help the companies to prepare the business strategies for the future and improve the business intelligence.

2. Literature Survey

2.1 A biometric-secure e-voting system for election processes:

The proposed system is capable of handling electronic ballots with multiple scopes at the same time, e.g., presidential, municipal, parliamentary, amongst others. The system caters for integrity of an election process in terms of the functional and non-functional requirements. The design of the system guarantees that no votes in favor of a given candidate are lost, due to improper tallying of the voting counts, with the proper incorporation of system FLAGpsilas. Transparency of voting follows through in all phases of an election process to assure the voter that his/her vote went in favor of his/her candidate of choice. Besides its main functional properties, the proposed system is designed to cater for several essential nonfunctional requirements. Of most importance are the requirements for correctness, robustness, coherence, consistency, and security. To verify the robustness and reliability of the proposed system, intensive computer simulations were run under varying voting environments, viz. voter density, voter inter-arrival times, introduced acts of malice, etc. Results of the simulations show that security and performance of the system are according to expectations. These results provide the proper grounds that would guide the decision maker in customizing the proposed system to fit his particular voting needs[1].

2.2 A hybrid mobile biometric-based e-voting system:

Information technology changes and gives shape to networked society all over the world today and its solutions are becoming main drivers in almost all fields of human life activity. One of those solutions is the empowerment of e-government technologies through mobile solutions. Although the acceptance rate of e-government applications is increasing, e-voting is hardly accepted as main tool in its field because it lacks in offering reliable solutions to common problems like fraud, bribery, anonymous character of the vote and absence of reliable independent observation. This paper proposes a mobile biometric-based design that solves such challenges and preserves transparency, privacy, and anonymity along with other essential services, using techniques such as Secure Sockets Layer encryption, certificate keys and 30 to 60 available seconds for security tokens. The paper also presents requirements analysis for the proposed design system of the hybrid mobile biometric-based e-voting system[2].

2.3 A mobile biometric-based e-voting scheme:

Information technology plays a huge role in the world today and its solutions are becoming vital in almost all fields of life. One of those solutions is e-government. However, in spite of the growing reliance on e-government applications, e-voting is still not widely accepted nor deployed because it lacks reliable solutions to problems like fraud, bribery, coercion, and absence of reliable independent observation. This paper proposes a mobile biometric-based scheme that solves such problems whilst preserving transparency and privacy along with other essential services using techniques such as trapdoor authentication and virtual receipts, in addition to a number of mechanisms including RSA blind signatures and GPS. The paper also provides a security analysis of the proposed scheme. A proof-of-concept implementation of this scheme has been built and successfully tested[3].

2.4 A Secure e-Voting Architecture:

The constant development in computer technology now gives rise to an efficient way of using computer or electronic medium of voting. However, it is being faced with the problem of non-anonymity, coercion and bribery. In this paper, elliptic curve is combined with ElGamal cryptosystem to enhance the security of e-voting architecture. Several points from (x, y) coordinates from elliptic curve are used instead of using a large integer along with ElGamal encryption that is based on probabilistic encryption (produces several cipher texts) which is used to ensure anonymity, non-coercion and receipt-freeness. A voter can also revote to find an appropriate answer to coercion at another location. With the proposed architecture, e-voting system should be fair[4].

2.5 Gaining Assurance in a Voter-Verifiable Voting System:

The literature on e-voting systems has many examples of discussion of the correctness of the computer and communication algorithms of such systems, as well as discussions of their vulnerabilities. However, a gap in the literature concerns the practical need (before adoption of a specific e-voting system) for a complete case demonstrating that the system as a whole has sufficiently high probability of exhibiting the desired properties when in use in an actual election. They discussed the problem of producing such a case, with reference to a specific system: a version of the Pret a voter scheme for voter-verifiable e-voting. They had shown a possible organization of

a case in terms of four main requirements - accuracy, privacy, termination and `trustedness'- and shown some of the detailed organization that such a case should have, the diverse kinds of evidence that needs to be gathered and some of the interesting difficulties that arise[5].

2.6 Application of the Cost Benefit Analysis method in Cloud Computing:

The aim of this paper is to introduce the expression of efficiency of the adoption of cloud computing in the Czech Republic, using the Cost Benefit Analysis method. The article will firstly specify the qualitative and quantitative benefits of cloud computing. Within the case study of private cloud implementation in the Czech medium-sized enterprise, the Cost Benefit Analysis method will be applied. The possibility of transferring all the implications of this technology to the financial statements will be outlined through the method[6].

2.7 A cyber security model in cloud computing environments:

Cloud computing is an emerging paradigm of computing that replaces computing as a personal commodity by computing as a public utility. As such, it offers all the advantages of a public utility system, in terms of economy of scale, flexibility, convenience but it raises major issues, not least of which are: loss of control and loss of security. In this paper, we explore a user-centered measure of cyber-security, and see how this measure can be used to analyze cloud computing as a business model[7].

2.8 Trust model to enhance security and interoperability of cloud environment:

Security and interoperability is the biggest challenge to promote cloud computing currently. Trust has proved to be one of the most important and effective alternative means to construct security in distributed systems. In order to efficiently and safely construct entities' trust relationship in cloud and cross-clouds environment, this paper proposed a novel cloud trust model and a new cloud security framework. The propose trust model is domain-based. It divides one cloud provider's resource nodes into the same trust domain. It designs different trust strategies for different roles. Trust recommendation is treated as one type of cloud services just like computation or storage. Based on the proposed trust model, it introduced a novel cloud security framework with an independent trust management module. Using the proposed security model, it introduced some trust-based security mechanisms. Results of simulation experiments show that the proposed security model can achieve high transaction success rate with high trust accuracy[8].

2.9 A privacy manager for cloud computing:

The biggest issue which should be addressed in cloud computing are security and privacy. Outsourcing data to other companies worries internet clients to think about the privacy data. Most Enterprise executives hesitate to use cloud computing system due to their sensitive enterprise information. This paper provides data integrity and user privacy through cloud intelligent track system. This paper discuss about the previous experiment done on the privacy and data management. The work proposes the Architecture or system which provides intelligent track in Privacy Manager and Risk Manager to address privacy issues which rules the cloud environment. They described several architectures for privacy management in Cloud computing[9].

2.10 Secured electronic voting protocol using biometric authentication:

This paper proposes a new secure e-voting protocol. This new scheme does not require a special voting channel and communication can occur entirely over the existing Internet. This method integrates Internet convenience and cryptology. In the existing protocols either the taller has to wait for the decryption key from voter till the voting process is over or the verification process has to wait until the election is over. But in the proposed single transaction voting protocol the entire voting process as well as the verification process is done as a single transaction compared to multiple transactions in the existing protocol. The advantage of single transaction is that it consumes less time that results in overall speeding up the voting process. It is shown that the proposed scheme satisfies the more important requirements of any e-voting scheme: completeness, correctness, privacy, security and uniqueness. Finally, the proposed protocol is compared with the existing protocols such as Simple, Two Agency, Blind Signatures and sensus protocols[10].

Conclusion from Literature Survey:

From above literature survey, it is concluded that it is possible to implement an autonomic system for E-voting using the technologies like Cloud computing and Android OS. Though the concerns for the security will be an issue but they can easily be solved by using NFC. The proposed system will be implemented on the android smartphones making it easy and quick to use.

3. Problem Statement

Development of an autonomic system that helps the employees to cast their votes easily with no pressure, holds records of the elections as well as the candidates contesting the elections, enables the management to conduct opinion poll for any product concerning the marketing of the product through voting by likes, contains a special

feedback module should be constructed in order to get response of general public on the latest products and their upcoming requirements and also helps to prepare reports.

6. System Framework

6.1 System architecture

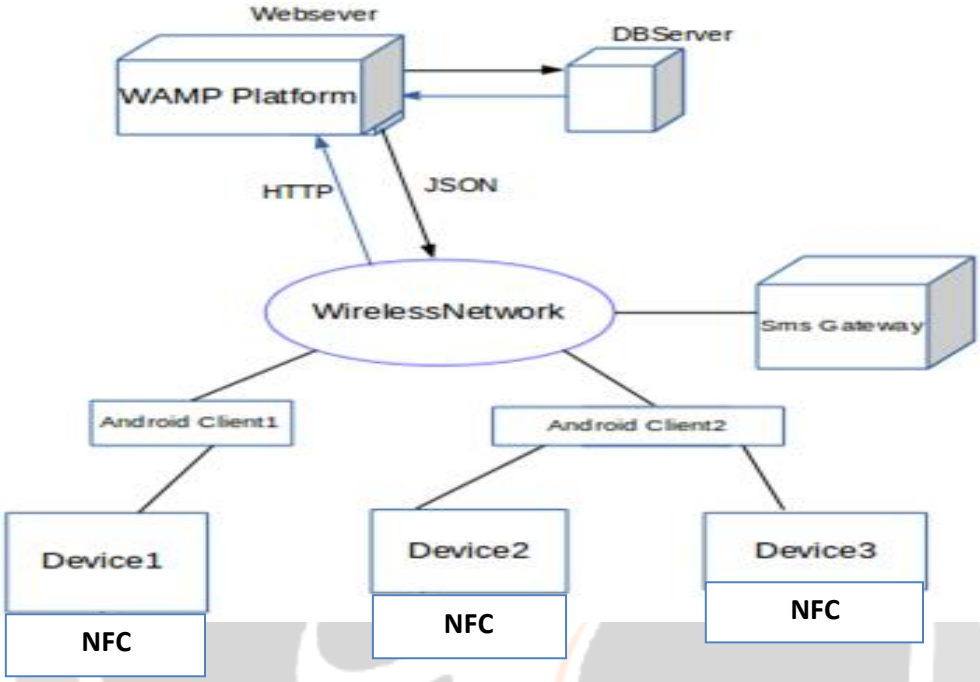

Fig -1: System Architecture

5.1.1 Web Server:
Set of web services are created to handle to requests from the android clients. Interact with database server as per the requirement of client requests. Request to SMS Gateway to send SMS for sending notifications.

5.1.2 Database Server:
Use to store all the data in the proposed system and when anyone requires data it can be fetched by the query and based on that it provides reply to the server.

5.1.3 Android Clients:
It is the main interface between the user and the system and consists of the application design with user friendly simple GUI. Will send requests to web server as login, registration, vote etc. and firther shows result back to user

5.1.4 NFC:
Used to process validation of requested client. Give feedback to web server about giving the authority of accessing location information to requested client.

6. CONCLUSION

Thus, an autonomic system can be developed that integrates Cloud Computing and android environment for doing voting through any smartphone using NFC card, handles the queries based on the data which is further stored on the cloud. It is concluded that with the technological advancement and progress in the field of Android OS and Cloud, we present an autonomic system that integrates Smartphones and Cloud Computing for conducting e-voting. Starting by describing challenges end-user applications are facing when using traditional computing and service model. The system addresses the issues related to time consumed and cost in a non-disruptive manner. From this system, everyone is gifted with ever ready service of voting through their cellphones from anywhere at any-time.

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