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Implementation of Cloud for Online Election System

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Abstract: ***The proposed paper presents the implementation of cloud for online election system. Cloud technology is becoming more popular day by day and evolving very rapidly. Firstly in the paper we discussed what cloud is, it's types and services offered .The main focus is to make feasible of online E – voting for citizen and increasing the experience of voter through online .A facial recognition system is used for security purpose and Hadoop's HDFS to implement distributed file system. And at last we talked about the advantaged of using cloud for E – voting system over others scenario.***

Keywords: Cloud Features, Apache Hadoop, Facial recognition system, Databases, remote login

I. INTRODUCTION

This Cloud term in computing area is generally denotes network. Cloud computing refers to a group of computers acting as servers placed remotely and can function or provide services to clients as per their needs. It involves for deploying set of remote servers and software networks that allow centralized data storage and online access to computer services or resources. It is recent and most widely used technology for files and data management. With the help of cloud the election commission implements the feature of remote login (through browser) which enables the voters to log into their accounts from their state as well as outside the state for taking part in the voting. The cloud is one which makes it feasible and availability of access of data during polling. The cloud computing architecture provides a mapping system and proper structure of online voting. A biometrics recognizer OpenCV is used for proper identification. It will verify pre stored aspects and characteristics of voter to provide him a logging credential. The massive workload on the traditional systems is reduced by distributing the computing tasks onto the cloud clusters .The implementation of cloud for voting system will encourage the experience of voters and increase the percentage of votes to select effective and popular candidate. Because due increase in industries in cities a huge amount of rural population lives temporarily in town/cities for job reason and earn money. For student, who is eligible for vote, the system is also helpful. The system hence creates a mass of educated and responsible citizen to use their right to vote.

II. SERVICES OF CLOUD

Cloud provides us with basically three types of services as:

A. Software As A Service (SaaS)

B. Platform As A Service (PaaS)

C. Infrastructure As A Service (IaaS)

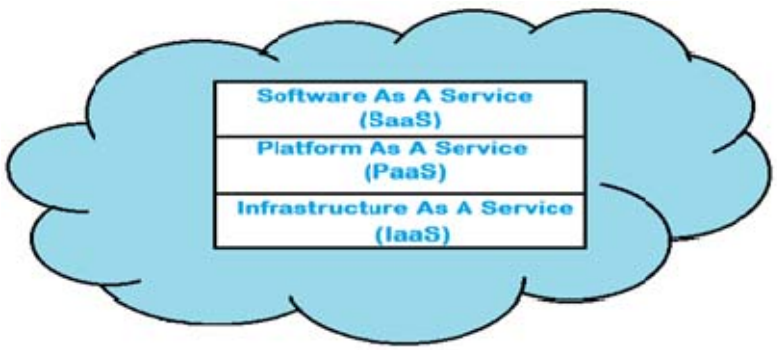

Fig : Cloud Provided Services

a) Software as a Service(SaaS)

This service enables us to use an application which is present and running on to another machine/system present on cloud. With this service we need not install the complete application on user system. The best example can be web based emails, acrobat.com.

By implementing cloud for election system, traditionally installed software on each user machine is no more a requirement.

b) Platform as a Service (PaaS)

In the PaaS models, cloud providers deliver a computing platform, typically including operating system, programming language execution environment, database, and web server. Application developers can develop and run their software solutions on a cloud platform without the cost and complexity of buying and managing the underlying hardware and software layers.

c) Infrastructure as a Service (IaaS)

IaaS provides access to the hardware services and infrastructure for hardware and software configuration. This service gives us storage of user data such as file server, application server on the cloud which can be accessed at any time.

The best example can be gmail, where all the mails are stored on to the google's cloud, which are accessible at anytime from anywhere.

III. TYPES OF CLOUD

There are three types of cloud

a) Public Cloud

b) Private Cloud

c) Hybrid Cloud

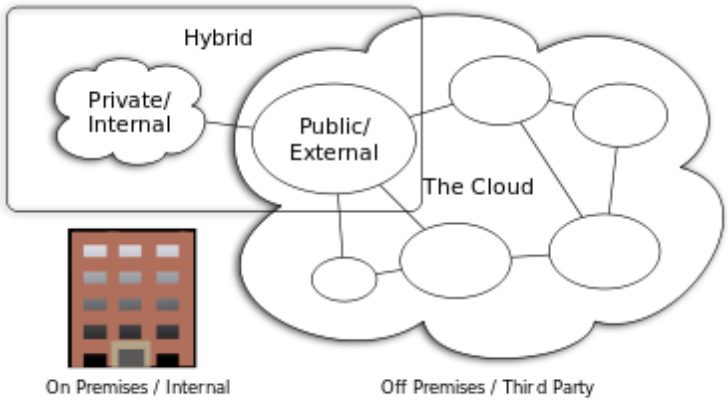

Fig : Cloud Computing Types

a) Public Cloud

For servicing many users public cloud is used. These services are open for all public use. These clouds are owned and maintained by third parties. It may be free of cost. All users can access the same infrastructure pool with different availability, security. Google's cloud is one of the best examples of public cloud.

b) Private Cloud

These clouds are hosted and managed by single organization. The main objective of private cloud is to offer greater control and data security. These cloud services are accessible only to authorized members of the organization. The resource management and configuration is done by the organization itself.

c) Hybrid Cloud

It is the combination of both public and private cloud (also may be combination of more than two). It not only provides the benefits of both public and private cloud models, but also overcomes their drawbacks. Hybrid cloud provides greater flexibility in computing.

IV. CHALLENGES IN DEVELOPING ONLINE VOTING SYSTEM

1. Security
2. Feasibility and Data Management
3. Availability

V. TECHNOLOGY

We will discuss the use of Hadoop and a facial recognizer OpenCV for the implementation of the system and how Hadoop is used to store data as distributed file system. We will focus on the most necessary steps required to implement the system.

a) Technology Used

We have used Apache Hadoop 1.0.4 as the underlying technology over which the files will be mapped and reduced.

GUI is developed using JAVA Swing utility for effective communication.

MySQL is used to store the information of authorized members as well as usernames and passwords.

For facial recognition OpenCV is used.

b) Implementation

There are three types of actors. They are interacting with each other.

1. Election Officer
2. Voter
3. Poll Centre

1. Election Officer

Election officer of each particular area will provide the username, password and necessary tools of login to the Poll Centre at the time of polling. By using these information voter can login to Poll Centre and vote for a candidate. The username and password will be issued by election officer after checking the all required and related documents summited by candidate before the election. Matrices of candidate's biological characteristics will also maintained by the election officer so that at the time of voting it could be verify that the actual person is trying to login to the Centre. The openCV open source software is used to

create the biological matrices. The matrices typically include eye's iris, fingerprint and normal pictures of front side of voter. These matrices are stored in database for further identification purpose.

2. Voter

Voter can login to Poll center at the time of polling and select a candidate from the given choice. Before this he/she has to apply by filling an application to his/her election officer's office for issuing username and password. Here all the documents given by the voter will be verified. If all documents are correct then a voter has to give their biological identity. Matrices are consisting of biological structures of voter is created. Corresponding to each voter at least one matrix must be created by using OpenCV software.

These all data are stored in Hadoop as a distributed file system. Information related to voted stored as distributed file system hence it will used for any type of election whether assembly election or local election. Voter's profile for each type of election is quite different and mapped through Hadoop for management of data.

3. Poll Centre

As soon as the information of a candidate is verified and it is guaranteed that candidate can able to vote, all these information is mapped to Poll Centre. All the notices about rules of E-Voting is also present to the Centre. It is available during polling and voter have login with related information to the Centre firstly. Then he/she will be redirect corresponding page for voting purpose. The biological matrices which are formed at the time of applying is checked here before issuing right to vote. If all information is matched then voter can vote through the Poll Centre.

VI. HARDWARE AND SOFTWARE CONFIGURATION

Our cloud is basically 3 node cluster having configuration as follows

- Processor: Intel i5
- Hard Disk: 500GB
- RAM: 4GB
- Operating System: Unix
- OpenCV version 3.0 Beta

The files which are stored onto the HDFS are basically in the form of replicas of replication factor 3. Each file in HDFS is stored in the form of sequence of blocks having block size of 64MB.File once stored on the HDFS is written once and read as many times as we want.

VII. ADVANTAGES

1).Authorized access: As Login information, such as usernames and passwords are provided to the authorized officer by election office staff only, hence no unauthorized person can gain access to the services of the cloud.

2). Data reliability: Whenever any node stops functioning due to any malfunction, the file can be easily accessed as the replicas are still available on the other nodes. In this way, files stored into HDFS are accessible in circumstances of any node failure.

3). Reduced paperwork: The GUI created by using the JAVA Swing utility serves as an effective medium to use the services available and thus reduces the paperwork.

4).Secure and Trusted: We used a facial recognition system which must matched at the time of vote. Hence it is secure and trusted.

5).Disk Failure: Whenever a namenode crashes, we might lose the data onto the HDFS. But the secondary namenode enables us to keep a periodic check of the namenode data and thus we can still have some of the data available.

6).Increase in Vote Percentage: A huge amount of population lives in town/city temporarily for earn money and job reason. Also students are living outside their hometown during study .By implementing online voting they can able to vote and hence automatically increase in its level.

7).Select a Good Leader: A responsible and well educated citizen can select good leader. By implementing online system the maximum a big part of educated people those living in outside their home town can also select leader for growth of nation.

VIII. Future Scope

Today cloud technology is very common and used frequently by companies and institutions. In term of storage, power, data management, scalability it is important. The model which we have developed is a prototype which can be further extended to a large level. All types of polling system including can be implemented using the system .Further a system can also be managed such that it could simulate and process for the citizens of india present outside the india. The three node cluster has the limitation to use the system at its place. So, the concept of remote login can be added to it through which the users can use the services from their systems anywhere around the globe.

IX. Conclusion

In this paper, I have studied the term cloud, its types and services offered.

An online election system is created throughout the paper for the increasing the vote percentage. The system is secure and offers a flexible way of voting without performing a long series of steps. The system solves issue of citizens and students living outside their hometown respect to their voting perspective.

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Author(s) Profile

Rabinadan Kishor, is pursuing the B.Tech. with Computer Science and Engineering from Meerut Institute Engineering & Technology of session 2012-2016. During the academic session he developed system for institute management and a social networking website for students. He also engaged in developing projects on J2EE platform as well as web developing areas. He is currently working with Blue Mix, a cloud based IBM product for providing cloud services. Front-End and Back-End of different portal are developed and designed by him.

