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Research paper

Cloud Based Secure Storage for Online Examination System

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Abstract

As there has been a vast advancement in information and communication technology, there is a need for change in traditional examination system. Traditional examination system is to be replaced by online examination system. A cloud based solution is proposed to tackle the various issues in educational institutions. Here, we propose architecture for an android based examination system using cloud computing concept. In this we attempt to show an applicability, usage of cloud storage in examination management in education. Android is used to simplify the tasks. The thumb verification device is used to authenticate the user. Some encryption techniques are used for providing security to data.

Keywords: *Cloud computing ;Data Encryption ; Data Mining ; Integrity ; Pattern Matching .*

1. Introduction

The examination assumes a vital part in social life, which is a vital methods for assessing the capacity of individuals. In existing examination system, exams has occupied more time of faculty as well as of students. After the exam is done the papers are to be collected, counted and transported to a secured location for checking. The cost and man-power required for such tasks is high .So to improve efficiency the online examination system can serve better convenience to faculty as well as student .So android application along with specified thumb verification device can be used. Distributed computing gives a dynamic arrangement of virtualized assets, versatility, flexibility, pay as you utilize and estimated benefit with the capacity to progressively arrangement and arrangement processing assets as need. In light of these highlights Cloud Computing is preferably suited for online examination. Capacity with Cloud registering furnishes clients with abilities to store and process their information in outsider server farms. Associations utilize the cloud in various administration models SaaS, PaaS, IaaS and sending models like private, open, cross breed, and group. Security concerns related with distributed computing comes into two classifications which are security issues looked by cloud suppliers and security issues looked by their clients (organizations or associations who have applications or store information on the cloud)

An Online Examination System should have the followings features.

1. Scalability
2. Low cost,
3. Interoperability,
4. Support multi-tenancy,
5. Low bandwidth consumption,
6. Maximum resource utilization,
7. Security,
8. Reliability.

Cloud computing is an ideal choice for this system as it provides the above requirements. Thumb verification device is also used for taking attendance of student.

2. Literature Review

In the cloud, assets are shared among the greater part of the servers, clients and people. So it is troublesome for the cloud supplier to guarantee record security. Subsequently it is simple for gatecrasher to access and abuse the information. In the event of trade off at any cost; entrusting cloud is of no utilization. A requirement for "basically solid and infeasible to get assaulted" system ends up noticeably crucial. The paper shows the record security display which utilizes the idea of half breed encryption plan to address security issues. In the proposed demonstrate, the encryption and unscrambling of different documents at cloud server is finished by utilizing blowfish and adjusted variant of RSA. Further, it is tried in cloud based environment: Open Nebula.

Cloud computing innovation drawn its consideration regarding IT world and is the changing the concentration of endeavors. As there is huge growth of internet technologies, Cloud Computing gained attention, reduction in cost of information storage and data processing, high growth in technologies of visualization, advancement in service oriented framework and network security also resulted in increased attention of Cloud based Computing. One of the key challenges in cloud technology is security. Risk ratio is considered as a base when an organization selects cloud computing. The security issues are focused in this paper. The meaning of cloud computing with a concise exchange over cloud computing is displayed before breaking down the security issues of cloud computing. At that point exchange of the segments which influences the security of the cloud and later talk on the issues of cloud security and issues looked by cloud specialist organization alongside some answer for the security issues. Integration testing is a key software improvement life cycle (SDLC) procedure.

In this proposed paper portrayal of improvement, outline of a cloud based secure multi cloud storage using encryption. Multi cloud storage is used by this application, to effectively maintain and store the client's data. Data Encoding technique and Multi Agent System (MAS) are the two mechanisms used. Both of these mechanisms are combined together to achieve information integrity and security for user's data in cloud storages. The admin's role is storing the data that clients upload. The client needs to register and login to upload the data. The client's details are stored on server when he registers. The transferred data of the customer is isolated into sub parts by an outsider specialist and after that each part is put away into a wide range of numerous cloud storages. Only the client can view his uploaded data. The third party agent (TPA) sends an alert to client informing him that the file is being tried for modification when any other person apart from client tries to access or modify the data. Recently the use of Cloud computing is done in various areas like cloud storage as service, cloud hosting as service, cloud distributed servers are increased. Considering the facts like the power utilization , stability of using services and the security of multi cloud, various threats to client's data on cloud storage can't be ignored. Information security in the cloud is assured by data access control. Due to outsourcing of data and untrusted cloud servers a challenging issue is generated in cloud computing. Customary access control plans are not any more practical to distributed storage frameworks, as they create number of encoded duplicates of similar information or requires a totally trusted cloud server. Assaults done by noxious client at distributed storage is hard to keep away from. In their proposed framework they are presenting the idea of numerous distributed storage alongside upgraded security by utilizing encryption procedures where as opposed to putting away total document on single cloud server, it will be segmented into numerous parts and after that encoded and put away on various cloud servers and the meta information required for decoding and revising the information will be put away in meta information administration servers.

2.1. Problem Statement

To replace the traditional examination system with a new examination system as there is need to simplify and increase the security of the traditional system.

2.2. Objectives

- To make a simplified and effortless examination system.
- To make it easier for student to appear for examinations for objective as well as subjective type questions. To reduce cost required for producing papers.
- To make it easier for examiners for checking the papers and allotting the marks.
- To facilitate the use of thumb print system for student's authentication.
- To reduce cost required for producing papers.

3. Existing System

In the existing system one major problem with education system, is the way examinations are conducted, which has not been changed over the past years where the students went to an examination hall, then appear for examination in a short time where they have to give their best as per the questions that they are faced with and then wait for the results. Quite frequently it has been observed that the students who had prepared for exam all the year have suffered mental breakdowns on the examination day or some other problem is faced and then they their exam went bad, while someone who got questions prior to examination in an illegal way had a terrific examination and then they got a better result.
The issue is that there are far excessively numerous inquiry of chance required here, anything could happen and it could agitate even the brightest of understudies. To handle this issue we are seeing new frameworks being presented like mid-terms or semester exams and unit tests. All these give a superior examination framework as they furnish understudies with a lighter calendar which enables them to encounter different zones of life, for example, sports and extracurricular activities, for example, music and drawing among which their fundamental ability lies. But, one major problem with such scenario is that it provides encouragement for students to study for getting maximum marks and remember knowledge for a little while only to be forgotten by them the time the next they appear for examination.

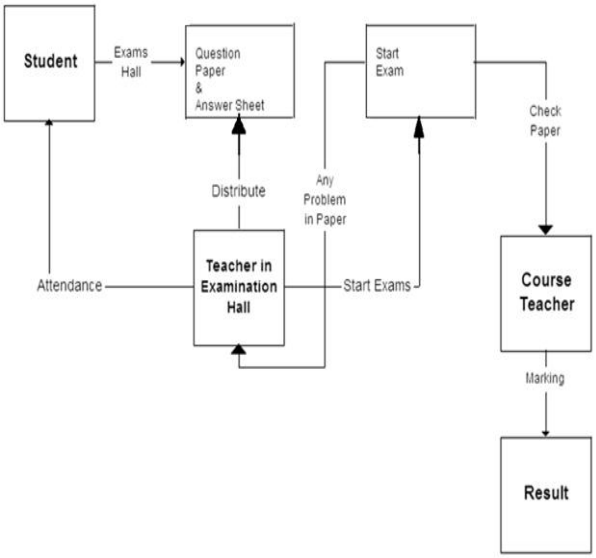

Fig. 1: An Overview of Examination System

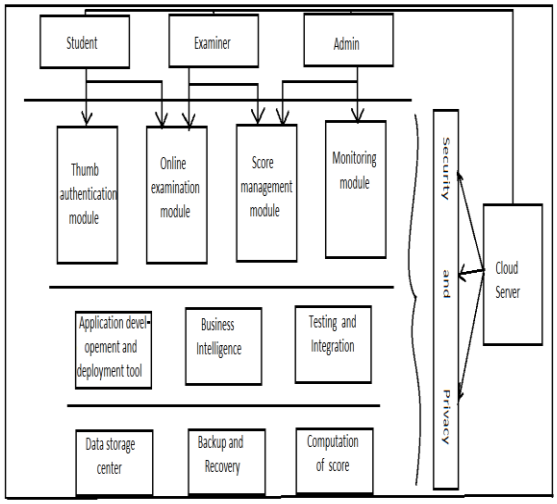

Fig. 2: Cloud Based Secure Storage System Architecture

4. Proposed System

There are three modules in this proposed system- admin, student and faculty. Admin has authority over faculty and student. He can view student and staff records, monitor the system and view the results. Accessing data, encryption decryption rights are given by admin.Faculty has the authority to check the papers by decrypting it without decrypting students details. Faculty submits the marks on cloud in encrypted format. New questions can be added by admins. Admin has rights to produce different reports according to use. Administrator could generate student result, and students can view their results online .The concept of cloud computing in proposed system is to create a storage area and upload the data which can be remotely accessed from anywhere and unauthorized user will not be able to access the it.

4.1. Mathematical Model

Let S be an online examination system,
S= {A, St, E, L, R, T, Qs}
Where A represents Admin,
A= {a0—>Qe}
S represent Student,
St={st0, st1, st2, ...stn}
E represent Examiner,
E= {e0, e1, e2, ...en}
L represent Algorithm,
L= {l0, l1, l2, ...ln}
R represent Result,
R= {r0, r1, r2, rn}
T represent hardware,
T= {t0}

Let Fa be a rule of A into R such that admin can view the result
Fa(A)—〉 R
For example, Fa(a0)—〉 {ro, r1, ..rn}εR
Fe be rule of E into St that Examiner can check the paper of student
Fe(E)—〉 St
For example, Fe(e0)—〉 {st0, st1, ..stn}εSt
Fs be rule of St into R that student can view the result
Fs(St)—〉 R
For example, Fst(st0)—〉 {r0}εR
Fl be rule of L into R that algorithm can process the result
Fl(L)—〉 R
For example, Fl(l0)—〉 {r0 ,r1, ..rn}εR
Fs be rule of St into T that student can authenticate through hardware T
For example, Fs(st0)—〉 {t0}εT

Input:
Login details, Random question papers, Answers.
Output:
Result.
Functions:
login(), validate(), submitMarks(), submitAnswer(), check(),
encrypt(), decrypt(), result().

1. Set Theory:-
Let S=be a online examination system.
2. System Input:-
Identify input as a N={n1, n2, n3, …nn} ,where n is the number of functions to be tested in the pool , S={N}.
3. Processing:-
Identify Process P= {A, St, E, L, R, T}
where, A represents Admin, A= a0->Qe
S represent Student, St={s0, s1, s2, …sn}
E represent Examiner, E={e0,e1,e2 ...en}
L represent Algorithm, L={l0,l1,l2, ..ln}
R represent Result, R={r0, r1, r2, …rn}
T represent hardware, T= {t0}
4. Output:-
Identify R as Output i.e the student's Result. S= {N, R}
Finally whole system represents as S , S= {A, St, E, L, R, T}
replace the traditional examination system with a new examina tion system as there is need to simplify and increase the security of the traditional system.

4.2. Advantages of Proposed System

- Secure Data Storage
- Minimal use of Hard Papers
- Appropriate control on examination system
- Reduction in Manual data entry
- Greater efficiency
- Secure Automated system.
- Required time will reduce

5. Conclusion

According to the current review we have thought of the inspiration of the issues looked by offline examination. The proposed framework can give solid and productive contribution to the current online examination framework. As Cloud technology is winding up effective system engineering to perform substantial scale and complex figuring implementing an Online Examination System will end up being extremely helpful. Its highlights the terms like versatility, ease, interoperability, multi-tenancy, security and reliability, etc. will be a great advantage

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