Remote locking system for secure examination using MQTT protocol

Kavya R.
kavyaramesh448@gmail.com
Vidya Vikas Institute of Engineering and Technology, Nadanahalli, Karnataka

Sahana B. R.
Sahana3lok@gmail.com
Vidya Vikas Institute of Engineering and Technology, Nadanahalli, Karnataka

Geethashri K. V.
geethashrikv@gmail.com
Vidya Vikas Institute of Engineering and Technology, Nadanahalli, Karnataka

ABSTRACT

At every level of the education in our system we have to face examination to check our knowledge on the curriculum exams designed on our domain basis. Frequently we have heard the news regarding the online exams question paper dropouts which will be a very bad drawback effect in the life of the students hence in our proposed system by using the Remote Locking system the Human intervention is completely removed thus it protects the examination paper dropouts at a maximum level. In Remote locking system if the lock is released from the authenticated person, then only the paper can be taken printout for the conduction of the exam.

Keywords: Paper Locking System, Question Paper Dropouts, Remote Locking with Zero Human Intervention.

1. INTRODUCTION

Examination is one of the sensitive portions of the candidate for the measure of their understanding about the subject, knowledge gained, and exposure to the skills how they record there learnt things in written formats with limited time regarding the domain or the subject he is interested and studied. But these days the candidates are facing the examination final Paper leakage where it is disappointing the major student's mindsets and leading to the depression. In this regard we have proposed the IOT based online examination conduction with the use of MQTT Protocol which is developed by IBM on OASIS standard for Textual Communication. Where we have majorly used TCP connection; in order to keep active all the connection between the notes which are interlinked to each other in the communication network. Drop outs of the examination papers can take place at various levels. It may be from where it is packed, from treasury officer officials, and from center where these papers are stored. Thus we have Proposed the below Architecture for the safe online examination paper printout taken at the examination centers. Where the Server is also one of the node which considered in the network where Admin has the control over it, thus if the Admin releases the code then only the sun nodes will receive it and paper print will automatically takes place even the code entry by humans is also not needed, where with the specified time once the admin releases the code automatically If the sub-nodes are active the print will start takes place only the count has to be entered.
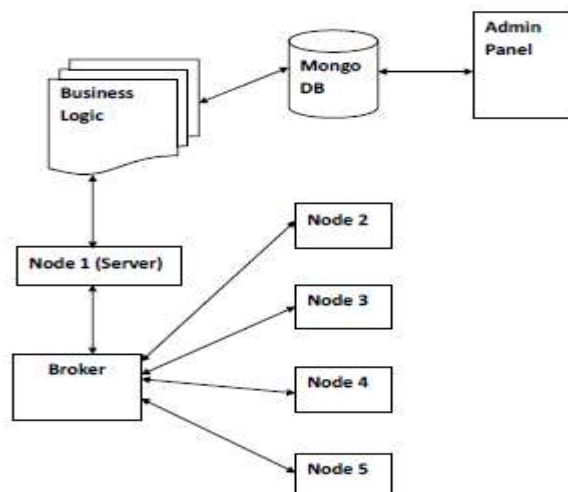

Fig. 1: Architecture of project

2. LITERATURE SURVEY

2.1 Question paper delivery system

There are plenty of question paper delivery system are there in that we have majorly two kinds and they are offline delivery methods of the question papers which may be by shipping or by any other transportation system and second methods is by online conducting the paper transportation and taking printouts where in the method of the online paper print of the question paper also we have to take many important steps to encrypt and decrypt the data i.e. the code which is shared between the nodes and hence secure the paper by avoiding the leakage before examination conduction. Hence in our approach we have used MQTT protocol on Mongo db for data storage.

2.2 MQTT protocol

"Message queuing telemetric transport" is an full form of MQTT protocol where it is an publish subscribe based messaging protocol which we have used in our proposal and where as TCP and UDP protocols are normally used for IOT appliances commonly and it is true in our case also. There are various other protocols XMPP, DDS, AMQP used to handle various issues but likewise we faced many drawbacks in these protocols also. Where it is also represents M2M i.e. machine to machine protocol. Where MQTT protocol also has some usefulness; like increases in reduction in bandwidth consumption, scalability, and efficient distribution of information. This protocol helps to connect devices and network with middleware and applications. The port of the default usually works based on TCP/IP port. The various types of MQTT are hivemq, pahoMQTT and so on. It is most vastly used connection protocol for M2M and IOT.

2.3 Question paper leaks

In recent technologies we have seen many methods how the examination paper has been leaked with many recent tools where the question paper usually leak with the faculty of the respective institution influence or mail plagiarism, whatever it may be at last method it will be difficult to overcome the consequences. Thus in this regard by our proposed system by using the IOT concepts we can overcome the Examination question paper dropouts.

3. REQUIREMENT ANALYSES

To achieve our aim below are the requirements regarding software and hardware.

System Requirements

- **The software requirements are:**
1. Database: MongoDB
2. Backend Language: PHP (Server) Python(Client Nodes) PHP (Broker)
3. Frontend Language: HTML, CSS, JS.
- **The Hard ware requirements are:**
1. System processor: 1.8GHz or more.
2. System RAM: 1GB or more.
3. Processor bit: 32bit or 64bit.
4. Hard disk space: 20GB or more.

4. DESIGN

In this phase we develop both high level and low level design and one of them i.e. the high level design of the praposed system is designed below and where both the data flow diagram and sequence diagram of high level design, explains how the remote locking system applied in the exam paper printing technique where it is purely the explanasion of different stages along with the protocols along with the communication between publisher and the receiver. Before developing the design we have architecture of the proposed system which will be designed which is depicted above in this paper and where the architecture gives a clear idea about requirements along with explanasion of the complete working of the system.
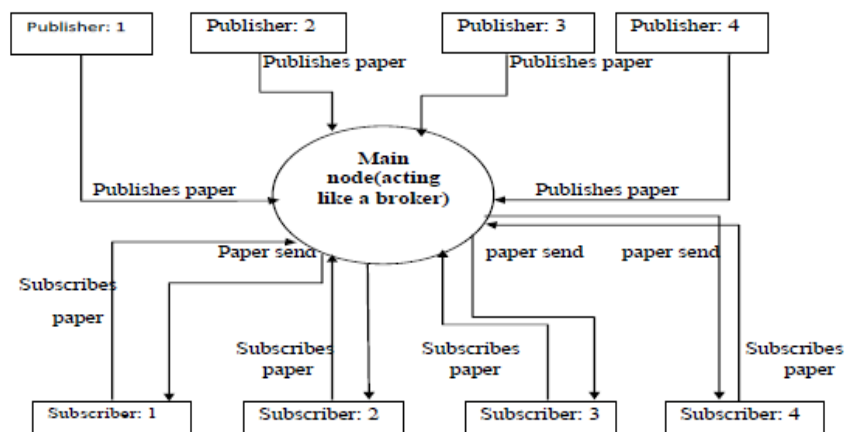

Fig. 2: Data flow diagram showing communication between publisher and suscriber

Fig2 depicts the high level design of the proposed system, where the broker or the main node, is the intermediation between the two ends i.e. publisher and subscriber, where the faculties at the publisher level upload question paper from the different institution to the server directly where the server by using random number generator picks one of the question paper uploaded by many faculties

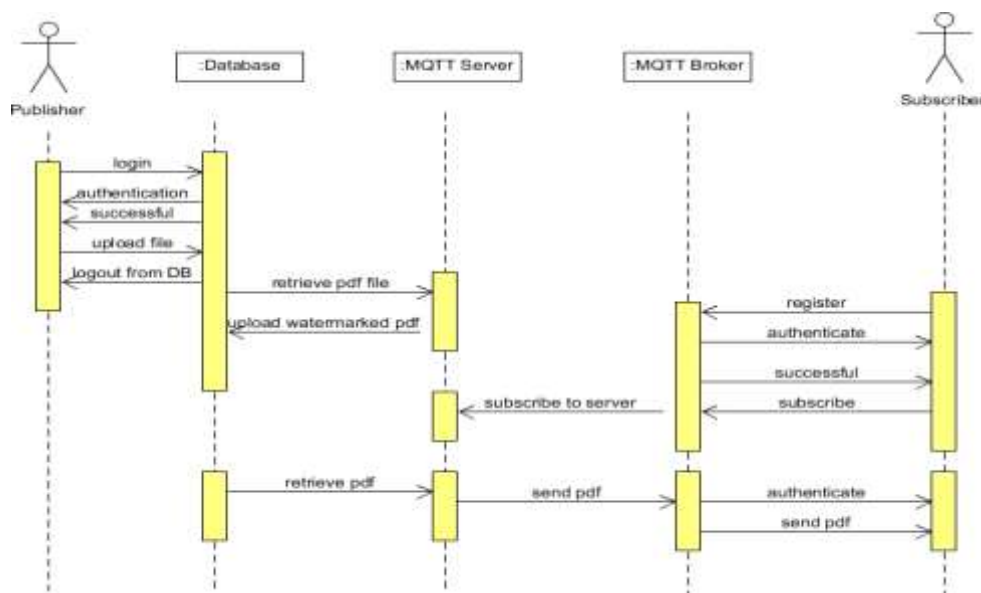and sends to the broker and then broker sends to the subscriber directly.

Fig. 3: Sequence diagram representing events

Fig3 above shows the Sequence diagram of the proposed system where initially, the publisher and the subscribers both should have to register themselves with the server in cloud. Where first the publishers need to register with username, password, and college details then later on they need to use the same credentials to login and upload the paper to the server.

5. CONCLUSION
Examination decides one's skill and proficiency in a subject. When it is conducted online it has to be done with more security feature. The process of written test is difficult and consumes more time and also the paper drop outs is more. This will only takes place when human interaction with the system will happen and also when he/she will have access to the paper where the it is stored; if human intervention is made zero the paper leaks or paper drop outs will be avoided.

Therefore, question papers are directly going to be printed in institutions on the examination day with the respective number of copies count with zero human interaction with the system and hence security of exam papers will be enhanced. Till now design of the system is completed. Further our work will be done based on to develop and implement the remote locking services for exam papers.

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