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A Novel Student Attendance Tracking System Using Android Mobile Phone

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ABSTRACT: Today's world has the largest issue in handling global temperature by cutting down on slaughter of green vegetation for the purpose of making paper. In this paper, the authors have tried to give an alternative where stuffs like that of keeping attendance records and managing them can be done without the usage of paper at all. In educational institutes normally the attendance of students are taken in normal printed stationery and to get consolidated report again the attendance is entered in computer and which is essentially a duplicate work. The present system based on minimizing wastage of papers but also minimizing wastage of manpower and time. In the present paper the authors have proposed a mobile enabled on-line attendance system which will not only save time but will save wastage of papers and indirectly help to make the environment green.

KEYWORDS: LAN, WAN, Server, Client, Networking

I. INTRODUCTION

The attendance system uses the mobile phone as the prime saviour of the problem. The mobile phone is connected to a database connected either through a LAN(Local Area Network) or a WAN(Wide Area Network) to the server containing the database. The mobile phone can be used to give and extract attendance from the database without using any usage of paper within.

The system deals with getting the information from the user that he/she has attended his/her workplace on time without making the intervention of any paper work in between thus saving a lot of wastage of paper and thus saving trees in return. The network devices (can have any Operating System), are connected to LAN(Local Area Network) using a router with the main database server. At this point when ever the user comes at a radius of ≤ 250 m (for a router with this particular specification) can connect to this network containing the database server. The user after connecting to this LAN has to open up the attendance application in their respective network devices. This application can be switched on only if the user has the correct authentication details(for example. Password details of the registered user to the database server). In case of connecting the network device to a WAN(wide area network), the device's location shall be checked using the GPS(Global Positioning System) installed in the respective network devices. If the GPS reading will be tallied with the reading from the location stored in the server database. If the reading differs in a manner such that, GPS reading > 250 meters from the location of the attendance office of the organization, then the user will not be able to open up the application in his/her network device. Upon successful opening up of the application, the user needs to give his/her authentication details and log into the network. The time limit for attendance will also be settled by the organization administration which will be stored in the remote server database. As soon as an user tries to give attendance after the time limit that has been extracted from the database, the user will be shown with an error message that database could not be updated at that point of time. Thus, the system, will be helping user and the administrator to be smarter in giving attendance and maintaining the employee book/ attendance register without any intervention of usage of paper, leading to a greener initiative.

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II. CONCEPTUAL MODELS

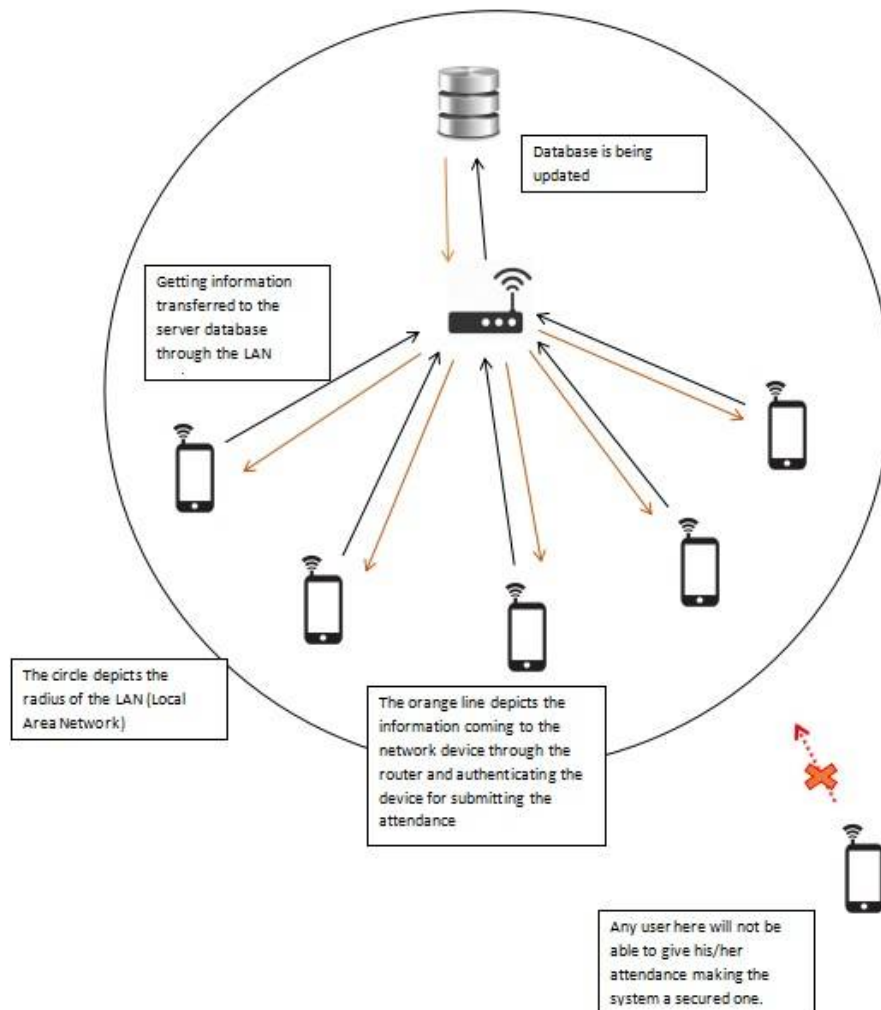


Fig 01: Depicting the working of the system in LAN implementation

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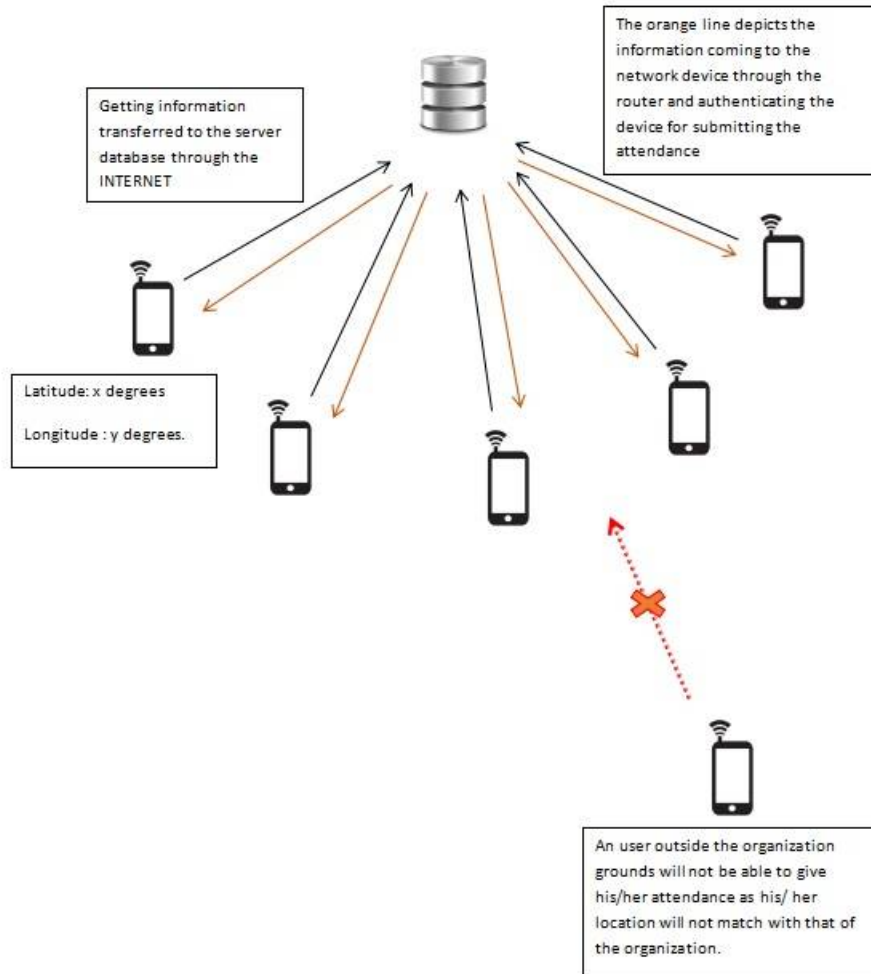


Fig- 02: Depicting the system implementation for a WIDE AREA NETWORK



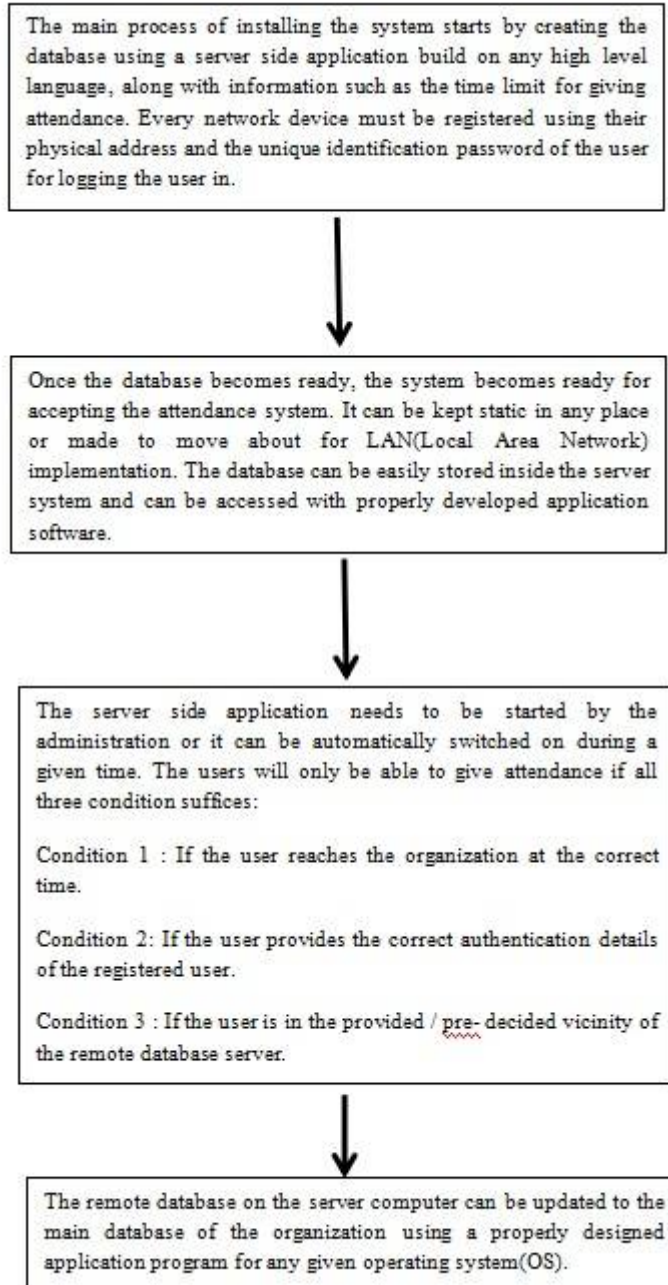
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III. BLOCK DIAGRAM FOR SYSTEM IMPLEMENTATION IN LAN



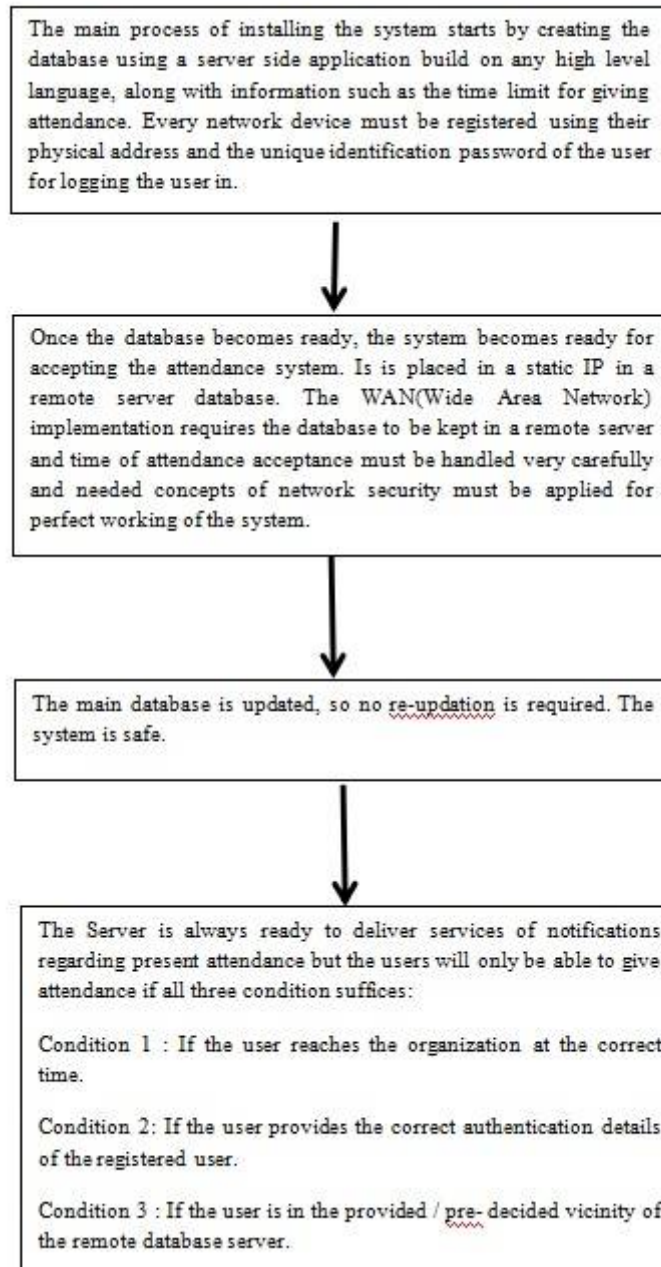
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IV. BLOCK DIAGRAM FOR SYSTEM IMPLEMENTATION IN WAN





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VI. LOGICAL AND IMPLEMENTABLE DETAILS

The system has been tested for a group of students of a class and their respective attendances were taken and the results were very promising. The system implementation details are tabulated as follows:

DATABASE SERVER USED	SQL SERVER 2008 ENTERPRISE EDITION R2
NETWORK TYPE USED	LOCAL AREA NETWORK (LAN)
ATTENDANCE SERVER SIDE APPLICATION	BUILT IN C# AS A WINDOWS FORMS APPLICATION (CAN BE EASILY EXPORTED TO OTHER O.S. AS WELL)
ATTENDANCE CLIENT SIDE APPLICATION	BUILT IN ANDROID O.S. (CAN BE EASILY EXPORTED TO OTHER O.S. AS WELL)

The client side application built on android operating system was a very user-friendly software. The main logic of the system can be expressed in the form of a well-laid out algorithm:

- Step 1** As soon as the teacher enters the class, he/she can switch on his/her computer/laptop and connect to any particular LAN(Local Area Network).
- Step 2** So, the database server is online and the teacher can start the server side application.
- Step 3** With the start of the server side application, the application generates a random HASH key and broadcasts the information on the server side machine. The server broadcasts the following information : Date, Professor Name, Subject Name, Semester details, Course Details for this particular testing group.
- Step 4** Any given student in order to start the client side application in his/her android device needs to enter his/her registered password as well as this HASH key.
- Step 5** The entering of HASH key, ensures that the student is physically present in the class.
- Step 6** Now, the student will be able to both check his/her attendance and enter his/her attendance. The application automatically downloads the result through the LAN(Local Area Network)
- Step 7** The student can only give his/her attendance at any point of time now.
- Step 8** As soon as the teacher feels that the class is over, he/she clicks on a button "END CLASS". This helps to end class and generates the second HASH key to be entered by the student.
- Step 9** The attendance gets updated only after the student enters the last password correctly into the system. The teacher can find all relevant details of the student's attendance on the server through the server-side application after the attendance gets updated suitably..
- Step 10** An acknowledgment is sent to the student on successful entry of attendance

The database can be accordingly designed on the server side as and for a given particular organization or community.



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VII. RESULTS AND DISCUSSIONS

The following results depict the working of the system for the tested group :

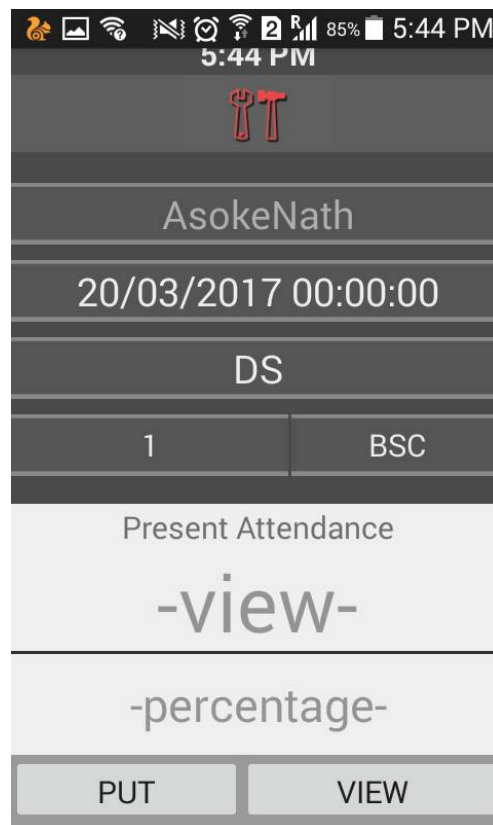


Fig. 03: The user-end application after successful connection to the server database and fetching the information that has been broadcast by the server.

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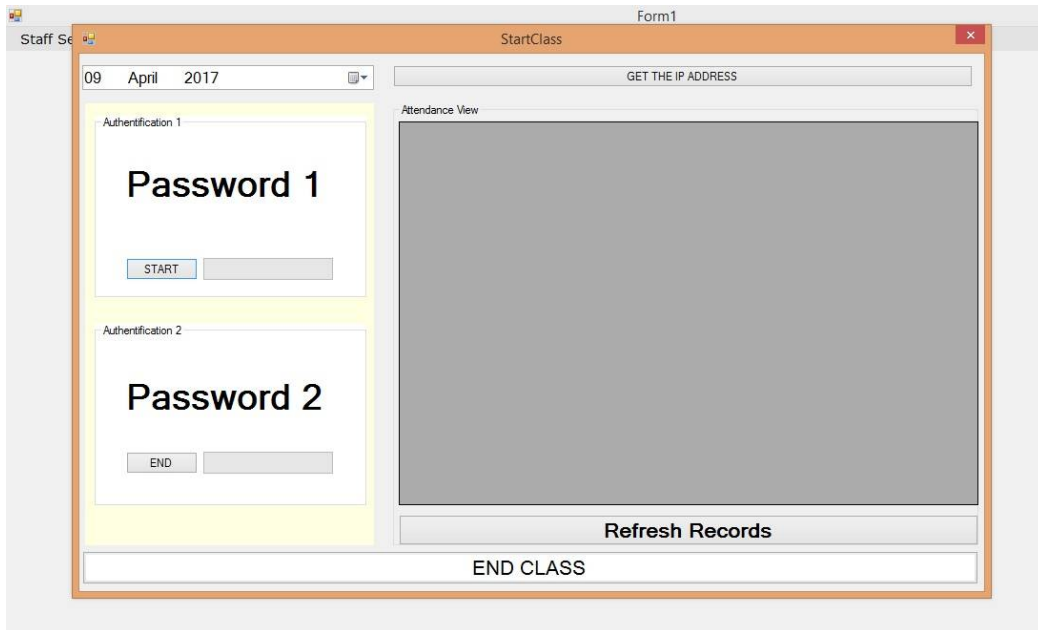


Fig. 04: The server side application before been started by the teacher.

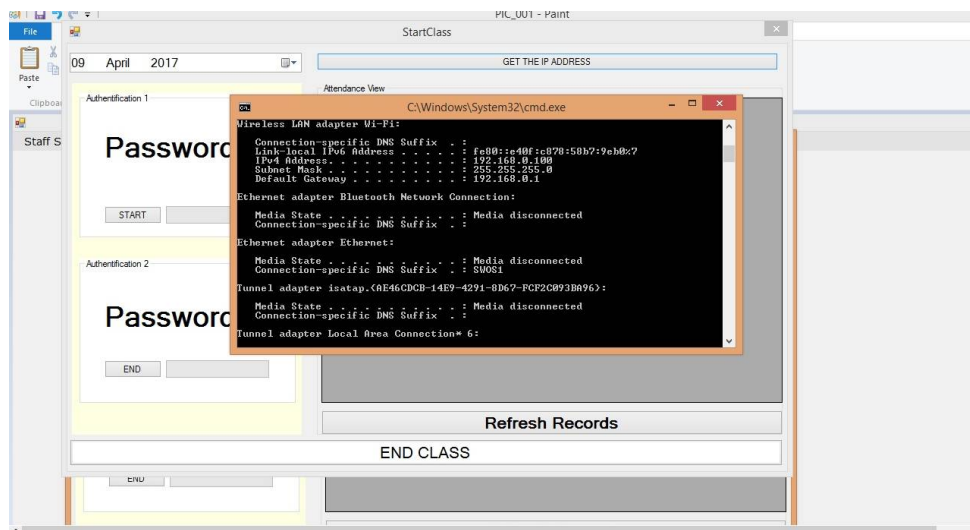


Fig 05: The Server-side application with the dynamic IPV4 address in the LAN for the user side network devices to connect with.

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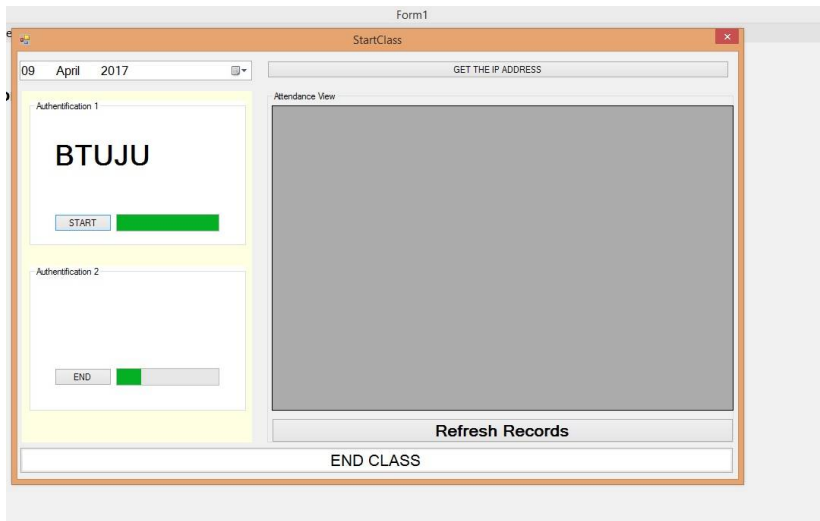


Fig 06: The Server-side application after generating the first HASH key.

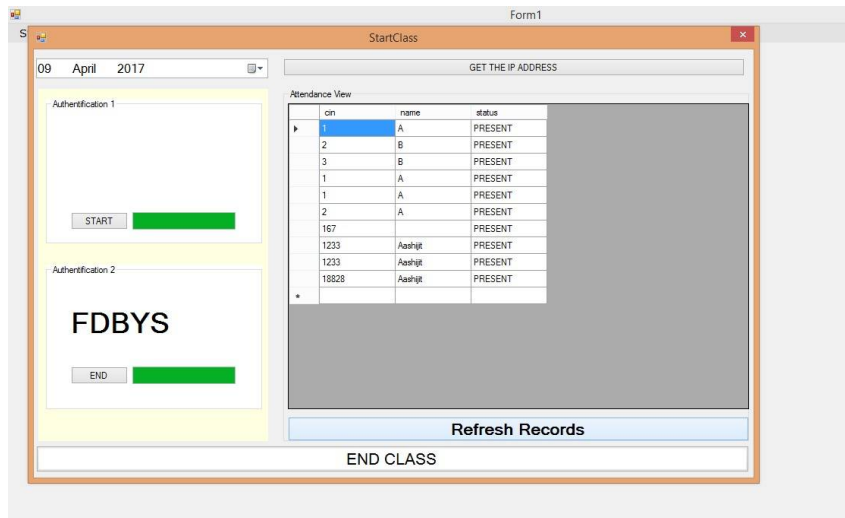


Fig 07: The Server-side application after generating the second HASH key and the recorded attendances from the network devices connected to the LAN(Local Area Network)



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VIII. CONCLUSIONS

The implementation will be different in different environment. But the results that have been seen in this prospect have got to say that it is good enough to be implemented in any organizations or communities for managing their attendance records. This can change the trend of keeping records on paper or using finger print which at times fail too. This method can be utilized in all types of organizations and will really be helpful for the rest of the globe to decrease the usage of paper.

IX. ACKNOWLEDGMENT

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BIOGRAPHY

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