2. Related Work

In cloud computing, several existing schemes that had been attempted to implement data privacy & security, data privacy and access control. Data is stored as public or private so different searching strategies are available for both types of data. The confidential data are stored in the cloud in encrypted format so only the authenticated members who know the key can access the data. Y.C. Chang and M.Mitzenmacher pointed the problem of efficiently retrieve some of the encrypted files containing specific keywords, keeping the keywords themselves secret and not to endanger the security of the remotely stored files [2]. In solutions for this problem under well-defined security requirements are offered. This method is efficient because of no public key cryptography is used. M. Bellare A. Boldyreva describes Deterministic and Efficiently Searchable Encryption where the encryption algorithm is deterministic. Consider application of outsourced databases, where data is sent to a remote server. The database server is untrusted [3]. The data in each field in the database is encrypted separately under the public key of a receiver, who needs to be able to query the server to retrieve the encrypted records containing particular data. Deterministic encryption provides a possible solution to the problem [3]. J. Li, Q. Wang,C. Wang, N. Cao, K. Ren, and W. Lou,[4] introduces the fuzzy keyword search over encrypted cloud data and also maintaining the keyword privacy. N. Cao, C. Wang, M. Li, K. Ren, and W. Lou,[5]highlight the challenge of secure ranked keyword search over encrypted cloud data also Ranked search greatly enhances system usability by enabling search result relevance ranking instead of sending undifferentiated results, and further ensures the file retrieval accuracy.

3. Proposed System

In this section, we present system architecture for proposed system.Figure.1 depicts architecture of proposed system for isolation preserved multi-keyword search over encrypted cloud.

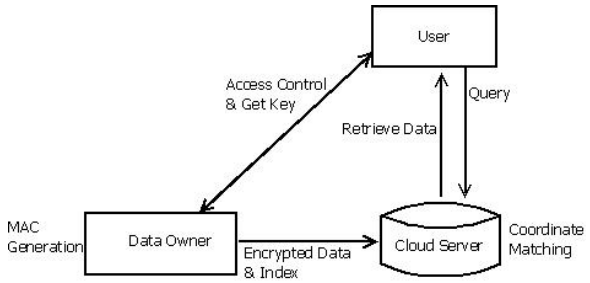

Figure 1: System Architecture

The system categorized into three entities Data Owner, Cloud Server, User or client. Data owner contains collection of data documents outsource on cloud server in encrypted form. Before outsourcing encrypted index for document is build. Outsourcing both index and encrypted document collection to Cloud Server. Cloud Server contains encrypted documents and index outsourced by the Data owner. Client provide query for searching document. Data integrity is check by Message authentication Code Algorithm.

The system is divided into following modules:
1. Binary data generation Module
2. Data ciphering Module
3. Data user access control Module
4. Data user query Module

In Binary data generation Module Data owner select the data and create the bit vector for that data. Using that bit vector of the data the binary data is generated. The binary data is the index for the data in the data owner. The bit vector is the bytes form of the data in the data owner. The bit vector is converted into the binary data. This bit vector and the binary data are ready for the data ciphering. Before that the message authentication code is generated for the data.

In Data ciphering Module the Data owner have to encrypt the original data by blowfish algorithm and send it to server. Then encrypt the binary data or the index and send it to server. Service provider did not know about the original content in the data owner. These indexes are used to refer the data in the service provider. It gives more security in the server side, so that the attackers can't use the data. Our system must prevent Server from learning any additional correspondence between plaintext values and cipher-text values except those obtained by prior knowledge. That is, we must protect the plain-text values for any encrypted records or queries from being disclosed to Server.

In Data user access control Module the user needs data from the cloud server. The users have different choices and the user send the query to the server or service provider. Before that the user gets the access from the data owner. For that the users end the details about him or her to the data owner. Then only the data owner receives the information from client and ready to send the decryption key. the access control mechanism is employed to manage decryption capabilities given to users This is a distributed setting where Server is on the remote side and not trusted. In Data user query Module the data user query is processed by the service provider. The service provider generates the bit vector for the query from the client. Then the service provider converts the bit vector into binary data. Service provider finds the similar data from the index. And send the encrypted data to the client. Then the client decrypts the received data by the key from the data owner using blowfish algorithm. And checks the integrity of the data by using the message authentication
Code

3.1 Proposed system Algorithm

Step 1: Authentication for data owner.
Step2: Data owner select data for Binary data generation and Message Authentication code generation
Step 3: Data owner have to encrypt the original data by blowfish algorithm and send it to server. Then encrypt the binary data or the index and send it to server.
Step 4: Provide access from the data owner to data user for data decryption.
Step 5: Data user checks the integrity of the data by using the Message authentication code Algorithm.

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3.2 Blowfish Encryption Algorithm

Blowfish is a symmetric block cipher that can be effectively used for encryption and safeguarding of data. It takes a variable-length key, from 32 bits to 448 bits, making it ideal for securing data.

Blowfish Encryption Algorithm is encryption technique for transforming plaintext data into cipher text, this algorithm generate key for encryption .Input to this algorithm is document selected by the data owner for outsourcing .output is cipher text of data in document.

- Key Generation:
  Blowfish uses a large number of sub keys. The P-array consists of
  18, 32-bit sub keys: P1, P2,...,P18
- Encryption:

- Blowfish has 16 rounds.
- The input is a 64-bit data element, x.
- Divide x into two 32-bit halves: xL, xR.
- Then, for i = 1 to 16:
xL = xL XOR Pi
xR = F(xL) XOR xR
Swap xL and xR
- After the sixteenth round, swap xL and xR again to undo the last swap.
- Then, xR = xR XOR P17 and
xL= xL XOR P18.
- Finally, recombine xL and xR to get the cipher text.

- Decryption:

-Decryption is exactly the same as encryption, except that P1, P2,..., P18 are used in the
reverse order.

4. Experimental Result

In this proposed architecture main goal is to provide efficiency and privacy of data. System also verifies data integrity of data.

To get result we choose data set e.g. book dataset for proposed system .Bit vector and Binary data generation for selected data provides privacy to data. Blowfish Encryption Algorithm provides more security to the outsourcing data compare to previous encryption technique for data Outsourcing. This prevent cloud server from learning additional information.

Only user with authentication by Data owner can perform search on cloud data. Cloud perform relative ranking for search query. Relevance result of search query is received to user.i.e provide a effective Data retrieval. A multi-keyword search method must provide the following user and data privacy properties

1) (Data Privacy) No one but the user can learn the actual retrieved data.
2) (Index Privacy) The search index or the query index do not leak any information about the corresponding keywords.
3) (Trapdoor Privacy) Given one trapdoor for a set of keywords, the server cannot generate another valid trapdoor.
4) (Non-Impersonation) No one can impersonate a legitimate user.

Efficiency of Data Retrieval as show in figure 2

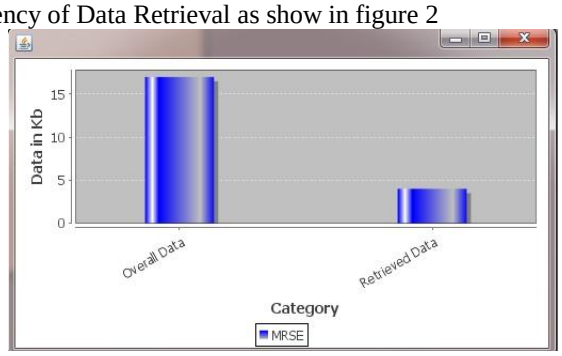

Figure 2 : Efficiency of Data Retrieval

Timing efficiency comparison for proposed system algorithm and existing system is as shown in figure 3

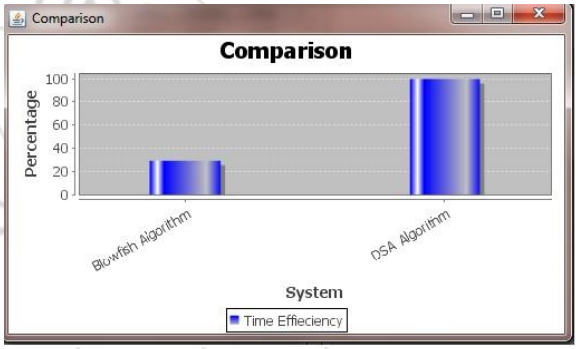

Figure 3: Timing Efficiency

5. Conclusion

In this paper, we proposed technique for efficient multi keyword search on encrypted cloud data. Bit vector and Binary Data generated for preserving data privacy. This system provides efficiency as receiving relevance result to user instead of differential result .This technique provides privacy in terms of keyword privacy, data privacy, Index privacy. Data Integrity checking is performed using Message Authentication Code Algorithm.

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