

## Regulated For Discrepancy Probe Service Station In Cost-Efficient Expenditures



**K. Vanajakshi Devi**

Associate Professor,  
Department of CSE,

Yogananda Institute of Technology & Science, Tirupati, AP.

### ABSTRACT:

Cloud computing, an internet based computing which shares, configures and modifies user data such that it can be accessed from anywhere and anytime. It is an emerging trend in the area of Technology, resource sharing and distributed networking, where extensively used in large organizations. As we are in an age of as pay as you go model, using of clouds is always affiliated to cost. Due to less efficient allocation resource, there will be a trade-off between degrees of delay and cost, such that user should tolerate a certain degree of delay while retrieving information from the cloud to reduce costs. We study about two major issues in such as user privacy and efficiency. Here privacy is attained by a unique technique called Rank privacy and efficiency by ranking query services. To attain privacy in cloud, a private searching scheme originally proposed by Ostrovsky with a private keyword based retrieval scheme allows a user to retrieve files of interest from un-trusted servers in leakage of any information.

The inadequacy of this scheme is processing of all the queries from different users, which cause a heavy querying overhead incurred on the cloud and thus preservation of cost efficiency. Efficient Information retrieval for Ranked Query (EIRQ) schemes to reduce querying overhead incurred on the cloud. In EIRQ, a user can select a rank for his requested query in order to retrieve certain percentage of matched files retrieve files on demand. This system introduces retrieval of files with low bandwidth and low computational and communication cost.

### Key Skills:

Cloud computing, Cost Efficiency, Differential query services, privacy.

### 1.INTRODUCTION:

Scattered figuring as an unindustrialized modernization is trusted upon to restructure data modernization humanities rather moderately than future. Because of the complicated assistances of scattered computing cost-adequacy, flexibility and resourcefulness, more associations decide to outsource their information for partaking in the cloud. As a regular cloud application, an association subscribes the cloud benefits and approves its staff to share documents in the cloud. Each greatest is depicted by an organization of slogans, and supervise as permitted clientele can convalesce documents of their interests by enquiring the cloud with detailed catchphrases. In such a territory, how to shield purchaser protection from the cloud which is a refuge external the security limit of the association prospects into a significant issue. Consumer retreat can be organized obsessed by quest security and access protection. Hunt for security indicates that the cloud knows nothing about what the client is looking for and access security indicates that the cloud knows nothing about which records are come back to the client. At the point when the records are put away free arrangements a imprudent answer for make sure client security is for the client to demand the countless part of the documents from the cloud along these lines the cloud can't know which records the client is truly captivated by though this important protection the correspondence expenditure is high. We recommend three EIRQ plans in light of the ADL to give an expense effective answer for private seeking in distributed computing.

\* The EIRQ plans can secure client protection while giving a differential question benefit that permits every client to recover coordinated documents on interest.

\* We give two answers for modify related parameters one depends on the other depends on Bloom channels.

\* Broad tests were performed utilizing a mix of recreations and genuine cloud organizations.

## 2. COLLECTED WORKS:

Collected works is the main indispensable step in software growth procedure. It is critical to determine the time factor economy and company strength before developing the tool. Once these things are fulfilled the next steps to be determine which operating system plus language can be used for developing the device. A long time ago the programmers begin building the device the programmers require more exterior support for developing the proposed system the above consideration is taken into account before building the system.

### 2.1 Designations and Resourceful Productions:

Searchable symmetric encryption (SSE) permits a gathering to outsource the capacity of his information to another gathering in a private way, while keeping up the capacity to specifically look over it. This issue has been the center of dynamic examination and a few security definitions and developments have been proposed. In this paper we start by assessing existing ideas of security and propose new and more grounded security definitions. We then present two developments that we show secure under our new definitions. Interestingly, notwithstanding fulfilling more grounded security ensures our developments are more proficient than every past development.

### 2.2 Secretive Incisive On Issuing Information:

Determine on this model we can adroitly execute looking for reports under a mystery criteria (Example: vicinity alternately nonattendance of a concealed blend of shrouded catchphrases) under different cryptographic suppositions. Our outcomes can be seeing in an assortment of courses as a thought's speculation of a Private Information Retrieval as positive results on privacy preserving data mining; and as a designation of shrouded system calculation to different machines.

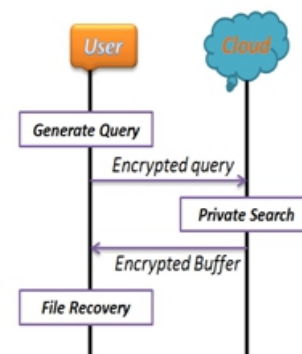
## 3. PREVAILING STRUCTURE :

Prevailing background reserved catchword constructed document recovery conspires that was initially proposed by Ostrovsky.

Their plan permits a client to recover documents of enthusiasm from an untrusted server without releasing any data. The primary disadvantage is that it will bring about an awe-inspiring searching overhead caused on the cloud, and in this manner conflicts with the first prospect of expense effectiveness. Private seeking was proposed by Ostrovsky which permits a client to recover records of enthusiasm from an untrusted server without releasing any data. On the other hand, the Ostrovsky plan has a high computational expense since it requires the cloud to transform the question on each document in a gathering. It will rapidly turn into an execution bottleneck when the cloud needs to process a large number of inquiries over an accumulation of countless records.

### 3.1 Downsides of Prevailing Structure:

- \* Ostrovsky convention experiences the issue of absence of collection of questions.
- \* Although it guarantees security by utilizing Parlier cryptosystem, it doesn't bring down the expenses brought about by the cloud's clients.
- \* Ostrovsky plan has a high computational expense.
- \* It requires the cloud to prepare the inquiry on each record in an accumulation.
- \*



### 3.2 Anticipated Structure:

Efficient Information recovery for Ranked Query (EIRQ) in which every client can pick the rank of his inquiry to focus the rate of corresponding records to be returned. The necessary thought of EIRQ is to develop a fortification saving cover network that permits the cloud to sift through a sure rate of coordinated records before coming back to the ADL. This is not an irrelevant work subsequent to the cloud needs to effectively sift through documents as indicated by the rank of questions without knowing anything about client protection.

Concentrating on distinctive outline objectives, we give two augmentations: the first expansion underlines effortlessness by requiring minimal measure of adjustments from the Ostrovsky plan, and the second augmentation stresses security by releasing minimal measure of data to the cloud.

### 3.2.1 Welfares of Anticipated Structure:

- \* A client can get back records on case by picking questions of distinctive positions.
- \* This element is helpful when countless records are yet the client just needs a little subset of them.
- \* The clients can recover coordinated records on interest to further lessen the correspondence expenses caused on the cloud.
- \* The cloud can't know anything about the client's inquiry protection access security and at any rate the fundamental level of rank privacy.

### 3.3 Practicality Learning:

The practicality of the venture is analyzed in this phase and corporatetender is put forth with a very general plan for the project and some cost evaluations. While system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis some understanding of the important requirements for the system is essential. Three key considerations involved in the prospect analysis are

- \* Economic Prospect
- \* Technical Prospect
- \* Social Prospect

#### 3.3.1 Economical Prospect:

This study is carried out to check the economic impact that the system will have on the organization. This study is carried out to give the economic impact of this project. The developing project using the most of the technologies which are available freely like net beans. This project is economically feasible.

#### 3.3.2 Technical Prospect:

This study is carried out to check the technical feasibility that is the technical requirements of the system.

Any system developed must not have a high demand on the available technical resources. This study is carried out to describe the technical feasibility of this project, but this project is implemented using net beans tool which is freely available software. This project can run by using net beans IDE.

#### 3.3.3 Social Prospect:

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. This project is easy to use. The users can read the document before running the system. After knowing about system, the users can efficiently use the project.

### 4. PLANNING OF ANTICIPATED STRUCTURE:

An ADL is organized in an association that approves its operate to share records in the cloud. The operate followers, as the approved customers, send their queries to the ADL, which will collective user requests and send a pooled request to the cloud. Then, the cloud procedures the pooled request on the file assortment and proceeds a buffer that contains all of matched files to the ADL, which will allocate the search grade to each user.

To collective sufficient requests, the organization may require the ADL to wait for a period of time before running our schemes, which may incur a certain querying delay. In the complementary file, we will discuss the computation and communication costs as well as the querying delay incurred on the ADL. User confidential isolation on query privacy and access privacy. In our work, user queries are classified into multiple ranks, and thus a new kind of user privacy, rank privacy, also needs to be protected against the cloud.

Rank privacy entails hiding the rank of each user query from the cloud the cloud provides differential query services without knowing which level of service is chosen by the user. Rank privacy can be classified into basic level and high level, where basic level will hide the rank of each query from the cloud, and the high level will further hide the number of ranks from the cloud.

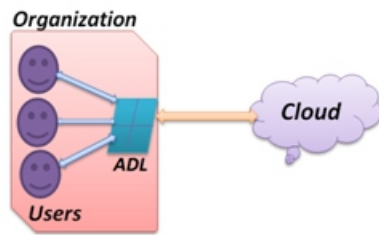


Fig: Planning of Anticipated Structure

## 4.1 Segment Depiction:

The development authorized as “Towards differential Query Services in Cost-Efficient Clouds” developed using Java and the Modules display as follows:

- \* Differential Query Services.
- \* Efficient Information Retrieval for Ranked Queries.
- \* Aggregation and Distribution Layer.
- \* Ranked Queries

### 4.1.1 Differential Query Services:

We present a novel idea, differential question administrations to COPS where the clients are permitted to buy and by choose what number of coordinated documents will be returned. This is roused by the way that under specific cases, there are a great deal of documents coordinating a client’s inquiry, however the client is occupied with just a sure rate of coordinated records. To outline, let us accept that Alice needs to recover 2% of the records that contain catchphrases “A, B”, and Bob needs to recover 20% of the documents that contain watchwords “A, C”. The cloud holds 1,000 records In the COPS plot, the cloud will need to return 1, 000 records. In our plan, the cloud just needs to return 200 records. Consequently, by permitting the clients to recover coordinated records on interest, the data transmission expended in the cloud can be generally decreased.

### 4.1.2 Efficient Information Retrieval for Ranked Queries:

We suggest a plan, termed Efficient Information recovery for Ranked Query (EIRQ), in which every client can pick the rank of his question to focus the rate of coordinated documents to be returned. The essential thought of EIRQ is to develop a protection safeguarding cover lattice that permits the cloud to sift through a sure rate of coordinated documents before coming back to the ADL.

This is not a paltry work, following the cloud needs to accurately sift through records as indicated by the rank of inquiries without knowing anything about client security. Concentrating on diverse outline objectives, we give two augmentations.

### 4.1.3 Aggregation and Distribution Layer:

An ADL is sent in an association that approves its staff to share information in the cloud. The staff individuals, as the approved clients, send their inquiries to the ADL, which will total client questions and send a consolidated inquiry to the cloud. At that point, the cloud forms the consolidated inquiry on the record gathering and returns a cradle that contains all of coordinated documents to the ADL, which will appropriate the indexed lists to every client. To total adequate inquiries, the association may require the ADL to sit tight for a timeframe before running our plans, which may bring about a certain questioning deferral.

### 4.1.4 Ranked Queries:

To further lessen the correspondence cost, a differential inquiry administration is given by permitting every client to recover coordinated records on interest. In particular, a client chooses a specific rank for his inquiry to focus the rate of coordinated records to be returned. This element is helpful when there are considerable measures of records that match a client’s question, yet the client just needs a little subset of them.

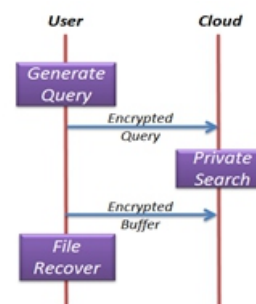


Fig1: The Ostrovsky Scheme

\* **Cost Efficiency:** The users can reclaim matched files on demand to further reduce the communication costs incurred on the cloud.

\* **User Privacy:** The cloud cannot know everything about the user’s search privacy, access privacy, and at least the basic level of rank privacy.



## 5. STRUCTURE EXPLANATION:

The imaginative EIQR structure and its to discriminate the three EIRQ structures, name the imaginative EIRQ structure as EIRQ Efficient, the first lean-to as EIRQ-Simple, and the second lean-to as EIRQ-Privacy. The basic idea of EIQR-Efficient is to concept a privacy-preserving mask medium with which the cloud can filter out a certain percentage of matched files before mapping them to a buffer. As established in the Ostrovsky scheme, the file existence rate is resolute by the buffer size  $\beta$  and mapping time's  $\gamma$ . Therefore, the basic idea of two extensions is that, for each rank  $i \in \{0, r\}$ , the ADL adjusts the buffer size  $\beta_i$  and the mapping times  $\gamma_i$  to make the file survival rate  $q_i$  approach  $1 - i/r$ . To better illustrate the working process of the EIRQ schemes.

### 5.1 The EIRQ-Efficient Scheme:

Before illustrating EIQR-Efficient, two essential difficulties would be determined:

Firstly, we should determine the relationship between query rank and the percentage of matched files to be returned. Suppose that requests are classified into  $0$  ranks. Rank-0 queries have the highest rank and Rank-r queries have the lowest rank. Simply regulate this connection by agreeing Rank- $i$  queries to retrieve  $(1 - i/r)$  percent of coordinated files. Therefore, Rank-0 queries can retrieve 100% of matched files, and Rank-r queries cannot retrieve any files.

Secondly, we should determine which matched files will be returned and which will not. Simply determine the probability of a file being returned by the highest rank of queries matching this file. Specifically, we first rank each keyword by the highest rank of queries choosing it, and then rank each file by the highest rank of its keywords. If the file rank is  $i$ , then the probability of being filtered out is  $i/r$ .

Therefore, Rank-0 files will be mapped into a buffer with probability 1, and Rank-r files will not be mapped at all. We will show how to adjust the buffer size and mapping times to achieve this goal. EIRQ-Efficient mainly consists of four algorithms, with its working process. Since algorithms QueryGen and ResultDivide are easily understood, we only provide the details of algorithms MatrixConstruct and File Filter.

**Step1:** The user runs the QueryGen algorithm to send keywords and the rank of the query to the ADL. Since the ADL is assumed to be a trusted third party, this query will be sent without encryption.

**Step2:** After aggregating enough user queries, the ADL runs the MatrixConstruct algorithm to send a mask matrix to the cloud. The mask matrix  $M$  is a  $d$ -row and  $r$ -column matrix, where  $d$  is the number of keywords in the dictionary, and  $r$  is the lowest query rank. The mask matrix  $M$  is a  $d$ -row and  $r$ -column matrix, where  $d$  is the number of keywords in the dictionary, and  $r$  is the lowest query rank.

**Step3:** The cloud runs the FileFilter algorithm to return a buffer that contains a certain percentage of matched files to the ADL. Specifically, the cloud multiplies the  $k$ -th elements of the rows that correspond to  $F_j$ 's keywords together to form  $c_j$ , where  $k = j \bmod r$ . Then, it powers  $|F_j|$  to  $c_j$  to obtain  $e_j$ , and maps the  $c$ - $e$  pair into multiple entries of a buffer, as in the Ostrovsky scheme.

**Step4:** The ADL runs the Result Divide algorithm to distribute search results to each user. File contents are recovered as the File Recover algorithm in the Ostrovsky scheme. To allow the ADL to distribute files correctly, we require the cloud to attach keywords to the file content. Thus, the ADL can find out all of the files that match users' queries by executing keyword searches.

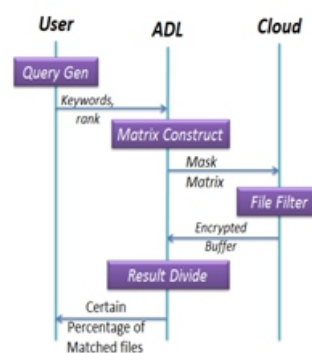


Fig2: The EIRQ-Efficient Scheme

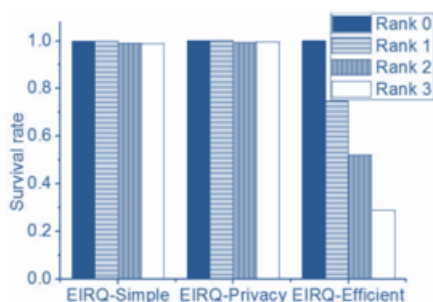
### 5.2 ASSESSMENT:

In this section, we will compare three EIRQ schemes from the following aspects: file survival rate and computation/communication cost incurred on the cloud. Then, based on the simulation results, we deploy our program in Amazon Elastic Compute Cloud (EC2) to test the transfer-in and transfer-out time incurred on the cloud when executing private searches.

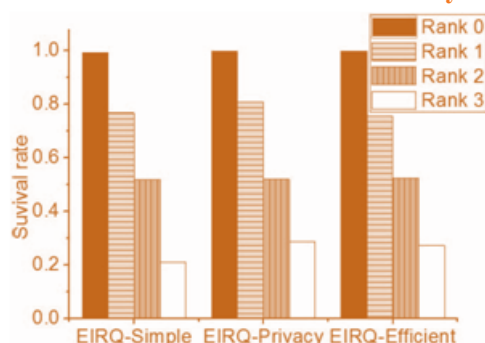
Note that the energyperformance trade-off is crucial to the success of cloud computing, and existing energy-saving techniques are hard to directly extend to a cloud environment. As part of our future extensions, we will evaluate the consumed energy overhead in the cloud to verify the effectiveness of our schemes. We use No Rank to denote unranked queries under the ADL. The summary of the experiment parameters are shown in Table 1.

Notation	Description	Value
$ F $	File Content	1KB
$ W $	Keyword Content	1KB
$N$	The Number of Users	1-100
$D$	The Number of Keywords in Dic	100
$K$	The number of Keywords in each Query	1-5
$W$	The Number of keywords in each file	1-5
$T$	The Number of Files shared in the cloud	1000
$\gamma$	The Lowest user rank	4
$A$	Threshold Value	0.1

**Table 1: Parameters**



**Fig3: File survival rate under Ostrovsky setting.**



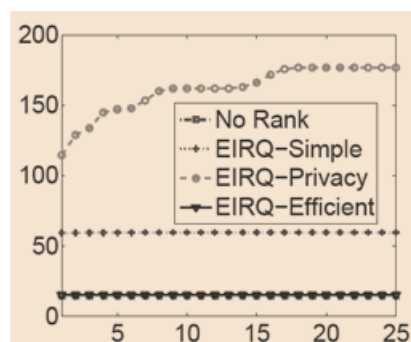
**Fig4: File survival rate under Bloom filter setting**

### 5.3 Wallet Endurance Frequency:

Subsequently requests are classified into 0 4 ranks, queries in Rank-0, Rank-1, Rank-2, Rank-3, and Rank-4 should retrieve 100%, 75%, 50%, 25%, 0% of matched files, respectively. However, the real failure rate in EIRQ-Simple and EIRQ-Privacy under the Ostrovsky parameter setting is much lower than  $i/r$ , and thus, the real file survival rate is higher than the desired value of  $1 - i/r$  (about 25% and 50% of files are redundantly returned to users);

Only EIRQ-Efficient, which filters a certain percentage of matched files before mapping them to a buffer, provides differential query services. Under the Bloom filter parameter setting, we first obtain corresponding mapping times. Specifically, for file survival rate 100%, 75%, 50%, 25%, we have the optimal mapping times 7, 2, 1, 0.4, respectively.

Based on these values, the buffer size can be calculated with Eqs. 4-6 for different schemes. In practice,  $\gamma$  and  $\beta$  must be integers. Thus, we use  $\gamma$  and  $\beta$  to replace the corresponding values. Using these parameters, the file survival rates for different ranks, where three EIRQ schemes can provide differential query services, and no bandwidth is wasted in each EIRQ scheme.



**Fig5: Bloom filter parameter setting**

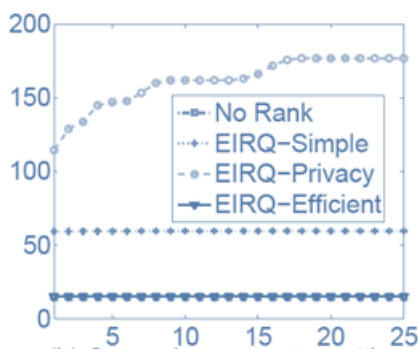


Fig6: Ostrovsky parameter setting

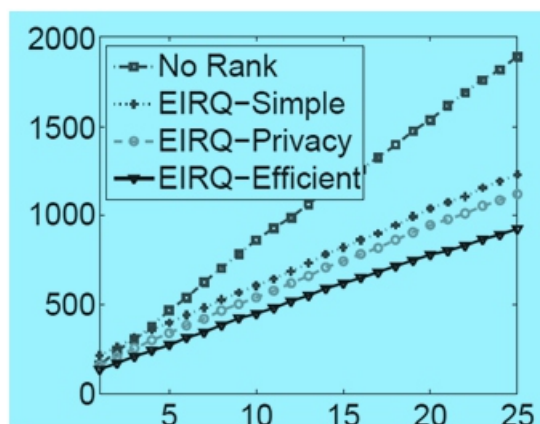


Fig7: 4 common keywords

## 5.4 Computational Cost:

As described the computational cost is mainly indomitable by the quantity of exponentiations performed by the cloud, which is almost the same under the Bloom filter and the Ostrovsky parameter settings. In order to justify the analyses, we will compare the computational cost between No Rank and three EIRQ schemes.

The comparisons of computational cost on the cloud are shown in Fig. 5, where the number of queries in each rank ranges from 1 to 25. In Fig. 5-(a), under the Bloom filter parameter setting, the computational cost is approximately 14.807s in No Rank, 59.274s in EIRQ Simple, 101.075s in EIRQ-Privacy, and 14.861s in EIRQ Efficient.

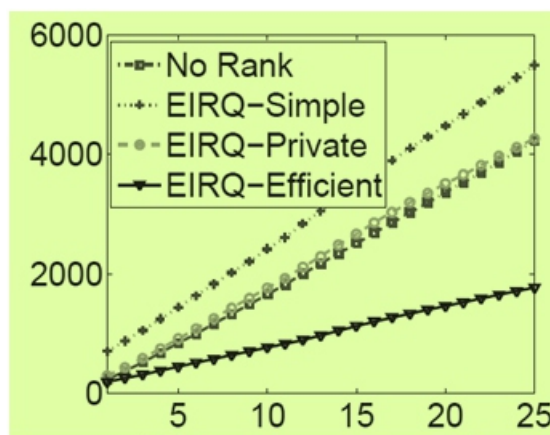


Fig8: 4 common keywords

## 5.5 Communication Cost:

As described in Section 6-(B), the communication cost mainly depends on the buffer size generated by the cloud, which is calculated in different ways under different parameter settings. Furthermore, the buffer size depends on the number of files that match the queries, which is different when users have different common interests, i.e., the average number of common keywords among user queries.

Therefore, in different parameter settings, we will analyze the buffer size under different common interests. In the following experiments, 1 common keyword, 2 common keywords, and 4 common keywords denote that the average common keywords among user queries are 1, 2, and 4, respectively; random keywords denote that each user randomly chooses keywords for its query.

Comparison of communication cost under the Bloom filter setting. The x-axis denotes the number of queries in each rank, and the y-axis denotes the buffer size (KB).

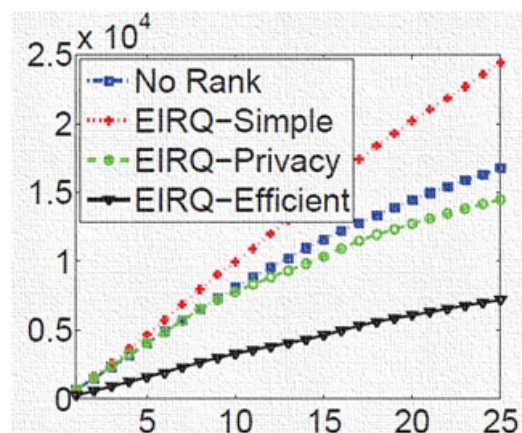


Fig9: Random keywords

Comparison of communication cost under the Ostrovsky setting. The x-axis denotes the number of queries in each rank, and the y-axis denotes the buffer size (KB).



The EIRQ schemes perform better under the Bloom filter setting compared to under the Ostrovsky setting. Under the Bloom filter setting, all of the EIRQ schemes consume less communication costs than No Rank, e.g., EIRQ-Efficient, EIRQ-Privacy, and EIRQ-Simple can further reduce communication costs by about 50%, 35%, and 30% compared to No Rank, respectively, when the queries share 4 common keywords. Under the Ostrovsky setting, EIRQ-Simple always consumes more bandwidth than No Rank, and EIRQ-Privacy only performs better than No Rank under certain conditions. In both settings, the EIRQ schemes consume less bandwidth as the common interests among users increase.

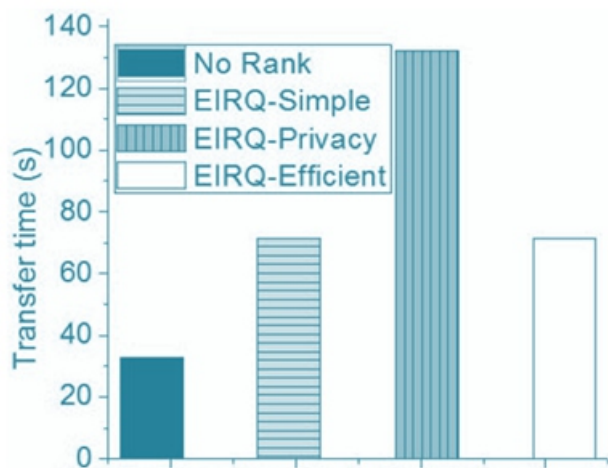


Fig10: Comparison under Bloom filter setting

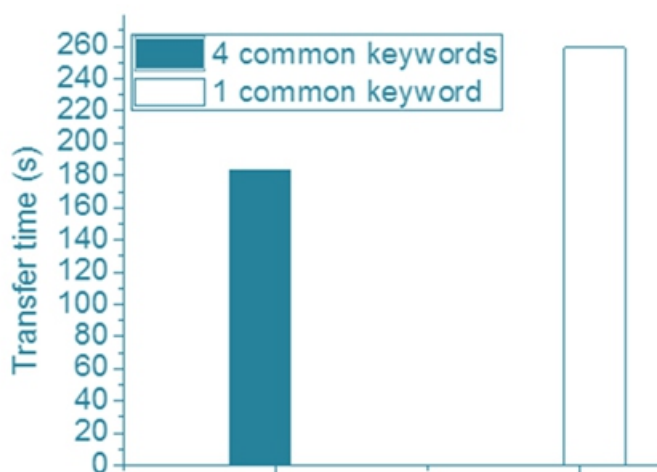


Fig11: EIRQ-Privacy under Ostrovsky setting

Test the transfer-out time at the cloud, which is mainly incurred by returning files to the ADL. The results are shown in Figs. 9 and 10. In all cases, EIRQ-Efficient consumes the least amount of transfer time, and EIRQ-Simple works better than No-Rank under the Bloom filter setting.

For example, under the Ostrovsky scheme, No-Rank consumes from 83.6s to 1191.8s, EIRQ-simple consumes from 189.8s to 1597.6s, EIRQ-Privacy consumes from 83.3s to 1099.9s, and EIRQ-Efficient consumes from 57.4s to 475.1s when there are 4 common keywords; No-Rank consumes from 191.1s to 3857.5s, EIRQ-simple consumes from 181.5s to 5369.7s, EIRQ-Privacy consumes from 161.8s to 3323.4s, and EIRQ-Efficient consumes from 81.3s to 1502.7s when there is 1 common keyword. Therefore, EIRQ-Efficient is most suitable to be deployed to a cloud environment. For example, the time to transfer a query from the ADL to the cloud consumes less than 100 seconds, and the time to transfer the buffer from the cloud to the ADL consumes less than 500 seconds, fewer than 4 common keywords.

## 6. CONCLUSION:

As raincloud presence an obsessive and evolving standard to be recycled, clients are conveyed with few of the complications like security, privacy and efficiency. In this research, we preserve user privacy by rank privacy instead of search and access privacy by abstraction of ranked queries by user. EIRQ schemes make an efficient effort in reclaiming the files that are of user attention with loss of bandwidth and thus minimizing the communication cost. These methods provide efficient results when user needs a small subset of files from large set of files. As we are using ranked query services along with multiple privacy preserving keyword search, computational cost will be greatly reduced when compared to previous techniques, making cloud services adaptable and usable to global market. EIRQ plan in light of the ADL, offers differential inquiry benefits that ensures client's security, a client can recover diverse rate of coordinated documents relying on the questions of distinctive positions.

Private looking systems are made more using so as to fit to an expense proficient cloud environment EIRQ plans in view of an ADL to give differential inquiry administrations while ensuring client security. By utilizing our plans, a client can recover diverse rates of coordinated documents by determining inquiries of distinctive positions. By further decreasing the correspondence expense acquired on the cloud, the EIRQ plans make the private seeking strategy more material to an expense effective cloud environment. Be that as it may, in the EIRQ plans, we just focus the rank of every record by the most elevated rank of inquiries it matches.



For our future work, we will attempt to outline an adaptable positioning system for the EIRQ plans. Here we legitimize the rank of every document by the most noteworthy rank of inquiries it matches and client recovers certain rate of records.

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## Author Details:

**Mrs. K. Vanajakshi Devi** received her M.Tech Degree in Computer Science Engineering from Nagarjuna University, received her B.Tech Degree in Computer Science Engineering from SV University, Tirupati, her currently an Associate Professor in the Department of Computer Science Engineering and Information Technology at the Yogananda Institute of Technology & Science, Tirupati, her research interests include Security and Privacy Issues in Cloud Computing. Her Papers Published on "Efficient Query Services and Secure File Retrieval in Business Clouds", [www.ijeted.com](http://www.ijeted.com), Volume 3 Issue 5, she has membership in MISTE and IAENG also serves as an academic coordinator and also published journals and attended conferences.