A Novel approach to Security Search on Mobile Cloud Encrypted Data

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Abstract: Cloud gives a climbable, auspicious and immense measure of capacity. The tempting innovation is done easily. Information security is the real disadvantages that keeps client from putting away document in the cloud with trustful way. The method for upgrading security from information proprietor perspective is to encode and unscramble the record subsequent to downloading them and information encryption makes[1] overwhelming overhead the cell phones and anyway information recovery acquires entangled correspondence between information client and the cloud. The primary issue is that in versatile it gives constrained battery life and restricted data transmission limit and result in correspondence and figuring issue. Subsequently it prompts scrambled pursuit over portable[2] cloud an extremely difficult one. Keeping in mind the end goal to keep this issues Traffic and Energy sparing Encrypted Search (TEES)a transfer speed and vitality sparing encoded seek over versatile cloud is proposed. A scrambled hunt design offloads the calculation from cell phone to cloud. It additionally advances the correspondence between versatile customer and cloud. Information protection does not corrupt when execution upgrade is connected. An encoded look diminishes the calculation time 23% to 46% and spares the vitality utilization 35% to 55% for each document recovery and system movement amid record recovery[5] are to be fundamentally decreased

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Keywords: - Mobile distributed storage, accessible information encryption, Energy proficiency, activity productivity.

I. Introduction: Cell phones have turned out to be so incorporated in the cloud conditions that individuals are truly looking at helping agents to complete their work effortlessly. The reality the Mobile Cloud Services are taken up by clients as opposed to endeavors racing to utilize them up for their own needs[4]. Versatile Cloud Computing can be considered by its exceptional focal points found in portable processing. At show, there is an extensive variety of portable cloud applications accessible. These applications fall into various zones, for example, picture handling, characteristic dialect preparing, shared GPS, shared Internet get to, sensor information applications, questioning, swarm figuring and media seek[4]. Despite the fact that there are a lot of advantages, there are a few issues to be tended to and fathomed. Figure 1 demonstrates information insurance dangers to manage information. System association reliance, information sharing and incorporating applications and security are a portion of the difficulties in MCC condition[6]. Another key test for Mobile Cloud Computing is discontinuity and system accessibility.

1.1 Working of MCC: The design of versatile distributed computing is appeared in fig1. The Mobile gadgets interface with the versatile remote system base stations. Some base stations are Satellite and Base Transceiver Station (BTS) [7]. They go about as the interface which builds up the system association between the cell phones and the web[6]. Client asks for are sent through the remote system to get to the cloud server by Authentication, Authorization and Accounting (AAA) component. After the conveyance of client solicitations to the cloud, the cloud controllers process those solicitations to furnish clients with the relating cloud administrations[8].

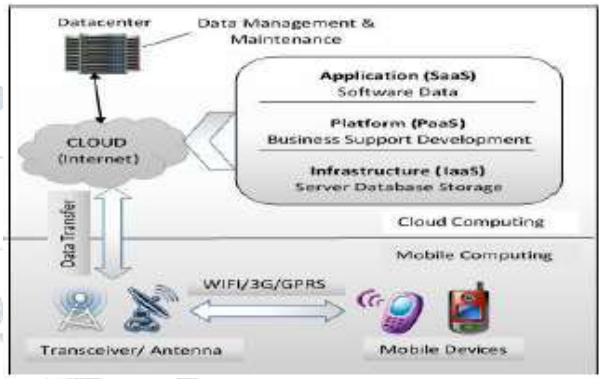

Fig No:1 Mobile cloud Computing

These cloud administrations are created with the ideas of Virtualization, Service Oriented Architecture (SOA) and Utility Computing. There is a controller called cloud controller which constructs, screen and deal with the remote system. It enables client to communicate two novel systems. A hypervisor is program which enables the numerous OS to share[7] a solitary server/machine. It is likewise called as Virtual Machine Manager (VMM). Application use and support are the upsides of the hypervisor.

II. Research Objective

2.1 Privacy protecting rank inquiry: Protection safeguarding multi-catchphrase positioned look over scrambled cloud information , and built up an arrangement of strict security prerequisites for such a safe cloud information usage framework to end up a reality. Among different multi-catchphrase semantics[6].
The proficient rule of coordinate matching, is choosed.i.e., whatever number matches as would be prudent, to catch the similitude between seek question and information archives, and further to utilize inner item similarity to quantitatively formalize such standard for likeness estimation. Here an essential MRSE plot utilizing secure inward item calculation[8], and afterward fundamentally enhance it to meet distinctive protection necessities in two levels of danger models. By and large examination researching protection and effectiveness assurances of proposed plans is given, and trials on this present reality dataset additionally indicate proposed plots undoubtedly present low overhead on calculation and correspondence. Security assurance positioning activity, ought not to release any watchword related data. Then again, to enhance query item exactness and additionally upgrade client seeking background. It is likewise vital for such positioning framework [9] to help numerous watchwords seek, as single catchphrase look regularly yields unmistakably result. As a typical

practice shown by the present web crawlers (e.g., Google look), information clients may have a tendency to give an arrangement of watchwords rather than just a single as the marker of their hunt enthusiasm to recover the most significant information. Also, every catchphrase in the pursuit ask for can enable restricted to down the output further. Coordinate matching, i.e., however many matches as could reasonably be expected, is an effective guideline among such multi-catchphrase[8] semantics to refine the outcome significance, and has been broadly utilized as a part of the plaintext data recovery people group. Be that as it may, to apply it in the encoded cloud information seek framework remains an exceptionally difficult errand as a result of inalienable security and protection snags, including different strict necessities like information security, list security, catchphrase security, and numerous others.

2.2 Enabling watchword seek straight forwardly finished scrambled information: Empower catchphrase look straightforwardly finished encoded information is an alluring procedure for powerful usage of scrambled information outsourced to the cloud. Existing arrangements give multi catchphrase correct hunt that does not endure watchword spelling mistake. It likewise utilizes single catchphrase fluffy hunt that endures grammatical errors to certain degree. The current fluffy seek plans depend on building an extended file that spreads conceivable catchphrase incorrect spelling, which prompt fundamentally bigger record document estimate and higher inquiry many-sided quality. The propose a novel multi catchphrase fluffy hunt plot by misusing the territory delicate hashing procedure. In this proposed conspire accomplishes fluffy coordinating through algorithmic plan as opposed to extending the list document. It likewise takes out the need of a predefined word reference and adequately underpins different watchword fluffy inquiries without expanding the file or inquiry many-sided quality. Broad investigation and analyses on certifiable information demonstrate that our proposed conspire is secure, productive and precise[10]. To the best of our insight, this is the main work that accomplishes multi-catchphrase fluffy hunt over scrambled cloud information. Accessible encryption, endeavors on giving plan powerful and effective systems to empower seek over encoded information. Rather than a word-by-word direct sweep in the full content inquiry, early works assembled different sorts of secure list and comparing file based watchword coordinating calculations to enhance look productivity. Every one of these works just helps the pursuit of single catchphrase. Ensuing works stretched out the inquiry ability to different, conjunctive or disjunctive, catchphrases seek. Be that as it may, they multi-catchphrase fluffy hunt over scrambled cloud information bolster just correct watchword coordinating. Incorrectly spelled catchphrases in the question will result in wrong or no coordinating. Recently, a couple of works stretched out the hunt ability to estimated watchword coordinating (otherwise called fluffy inquiry). These are just for single catchphrase seek, with a typical approach including growing the record document by covering conceivable blends of watchword incorrect spelling so a specific level of spelling blunder, estimated by alter separate, can be endured. In spite of the fact that a trump card approach is embraced to limit the extension of the subsequent file document, for a l-letter long catchphrase to endure a blunder up to an alter separation of d, the file must be extended by O (l d) times[8]. Along these lines, it isn't adaptable however the capacity multifaceted nature increments exponentially with the expansion of the mistake resilience. To help multi-catchphrase seek, the pursuit calculation should run numerous rounds.

2.3 Efficient positioned watchword seeks over outsourced cloud information:-

Distributed computing financially empowers the worldview of information benefit outsourcing. In any case, to secure information protection, touchy cloud information must be scrambled before outsourced to the business open cloud, which influences compelling information usage to benefit an extremely difficult undertaking. Albeit conventional accessible encryption systems enable clients to safely seek over encoded information through watchwords, in which they bolster Boolean hunt and are not yet adequate to meet the compelling information use require that is naturally requested by expansive number of clients and enormous measure of information records in cloud. It characterizes and takes care of the issue of secure positioned catchphrase look over encoded cloud information. Positioned look significantly improves framework ease of use by empowering query item pertinence positioning as opposed to sending undifferentiated outcomes, and further guarantees the document recovery exactness[9]. In particular, we investigate the factual measure approach, i.e. importance score, from data recovery to fabricate a safe accessible list, and build up a one-to-many request safeguarding mapping method to appropriately secure those touchy score data. The subsequent plan can encourage productive server-side positioning without losing catchphrase protection. Intensive examination demonstrates that our proposed arrangement appreciates as-solid as-possible securities ensure contrasted with past accessible encryption plans, while effectively understanding the objective of positioned catchphrase look. Outsourcing information to cloud servers, while expanding administration accessibility and lessening clients' weight of overseeing information, definitely gets new concerns, for example, information protection, since the server might be straightforward however inquisitive. To intervene the contentions of information ease of use and information protection in such a situation, research of accessible encryption is of expanding interest. Roused by the way that a cloud server, other than its interest, might be narrowing minded with a specific end goal to spare its calculation and additionally download data transmission [11]. The accessible encryption issue within the sight of a semi genuine however inquisitive server, which may execute just a small amount of pursuit tasks sincerely and restore a small amount of inquiry result sincerely. To battle against this most grounded foe ever, an unquestionable SSE (VSSE) conspire is proposed to offer irrefutable hunt capacity in extra to the information protection, both of which are additionally affirmed by our thorough security investigation. Moreover, we treat the common sense/proficiency as focal necessities of an accessible encryption conspire too. To this end, we executed and tried the proposed VSSE, with true informational indexes, on a workstation (fill in as the server) and a cell phone running Android 2.3.4 (fill in as the client). The trial results hopefully recommend that the proposed conspire fulfills the greater part of our outline objectives.

2.4 Traditional encoded look:- The customary encoded seek framework over the cloud is made out of three unique members, Provider, Cloud and User. The Provider has an arrangement of reports and their lists. It expects to outsource these to the cloud and let clients contact the cloud for the pursuit benefit. The Cloud is a business association that gives calculation and capacity assets as virtual Machines, known as cloud administrations[11]. The User is somebody who submits catchphrases to seek records that contain these watchwords. Clients would utilize cell phone, for example, cell phones and tablets to submit seek demands. The heaviness of lines shows the measure of information being exchanged.

2.4.1 Documents and lists transferring process: In the first place, the supplier accountable for this stream stems all words in these archives to be put away in the cloud and holds these terms. At that point each term is encoded and considered as one record's watchword. The encryption calculation can utilize the exemplary symmetric-key cryptography calculation, for example, the Advanced Encryption Standard. The recurrence of each term in the archive set is checked and after that composed into the comparing passage of the report file. At long last, the supplier encodes this list and outsources it to the cloud with the scrambled archives[12]. Generally, this list is a word recurrence table scrambled by the process able encryption calculation.

2.4.2 Trapdoor age process: To play out a pursuit ask for, the client initially verifies with the supplier. Amid validation, the give would send its mystery key to the client to unscramble the archives put away in cloud. Once validated, the client would send the hunt watchwords to the supplier. The supplier at that point figures trapdoors, regularly with FAH calculations and answers back. In such case, two round excursions are required (confirmation and trapdoor age) for a client to acquire the trapdoor for the inquiry catchphrases.

2.4.3 Document recovery process

In this procedure, the client sends the noised trapdoor to the cloud. The cloud then removes commotion in the trapdoor and quests the files with a pursuit calculation. At the point when records are discovered, the cloud positions them as indicated by each archive's score. At that point the best k significant archives are picked and sent to the client. At long last, they are unscrambled and recuperated by the client. As a rule, the Ranked Serial Search (RSS) algorithm is picked as the pursuit calculation[7].

2.5 Plaintext fluffy watchword seek

The fluffy pursuit has attracted wide consideration the setting of seeking in data recovery network. In view of estimated string coordinating they enable clients to question without utilizing attempt and-see conspire for finding applicable data, however this helpless development effortlessly experiences the word reference and measurements assault and unfit to accomplish look security. Conventional accessible encryption conspires for the most part make an encoded accessible file for every watchword and connect the file with the information reports which contain the catchphrase. To enhance look semantics, conjunctive catchphrase seek over scrambled information has been proposed, yet this plan brings huge costs as a result of their major natives, for example, calculation fetched by bilinear guide. The predicate encryption plans bolster both conjunctive and non-conjunctive question. In any case, none of those current Boolean watchword accessible encryption approaches bolster positioned and fluffy catchphrase seeks.

III. Existing System: In the current framework include numerous techniques for catchphrase seeks. In Information Retrieval, utilizes a TF-IDF (term recurrence opposite record frequency).TF-IDF (term recurrence backwards report recurrence) is a measurement which reflects how essential a word is to an archive in a gathering or corpus. Information protection issue is foremost in distributed storage framework, so the delicate information is scrambled by the proprietor before outsourcing onto the cloud, and information clients recover the Intrigued information by scrambled pursuit conspire. In MCS, the cutting edge cell phones are faced with a large number of indistinguishable security dangers from PCs, and different conventional information encryption techniques are foreign in MCS [10]. The bad marks in versatile distributed storage framework acquires new difficulties over the conventional scrambled pursuit plans, in light of the constrained registering and battery limits of cell phone, and also information sharing and getting to approaches through remote and furthermore unused as a weighting factor in catchphrase based recovery and content mining. To beat the issue in conventional information encryption strategies, here utilize an Efficient Encrypted Data Search as a Mobile Cloud Service. This design faces numerous difficulties offloads the calculation from cell phones to the cloud and enhance the correspondence between the versatile customers and the cloud. This imaginative plan utilizes a lightweight trapdoor (scrambled watchword) pressure technique, which streamlines the information correspondence process by decreasing the trapdoor's size for movement effectiveness. Anyway execution improvement is issues in effective scrambled information seek.

3.1 Disadvantage

• Data can't be compacted.
• Weighting factor in catchphrase based recovery and content mining.
• Data proprietor before outsourcing onto the cloud, and information clients recover the intrigued information by encoded seek conspire its take additional time.
• Mobile distributed storage framework causes new difficulties over the conventional encoded look plans.
• Limited processing and battery limits of cell phone.
• Bandwidth and vitality productivity for information encoded look conspire, because of the constrained battery life and payable activity expense.

IV. Proposed System

In the proposed framework here utilized a (Ranked serial double pursuit) RSBS. This creative plan utilizes a lightweight trapdoor (encoded watchword) pressure strategy, which advances the information correspondence process by lessening the trapdoor's size for movement proficiency. Here propose two enhancement strategies for report look, called the Trapdoor Mapping Table (TMT) module and Ranked Serial Binary Search (RSBS) calculation to speed the inquiry time[8]. RSBS Algorithm after getting a trapdoor (encoded type of hunt catchphrases), the cloud would play out a protection safeguarding look from the lists given by the supplier. At that point it chooses top-k records that contain the given inquiry catchphrases. This procedure is accomplished by utilizing the RSBS calculation. The RSBS calculation means to locate the best k records that best match the hunt catchphrases given by the client. To this end, it keeps up a score cluster for each archive.

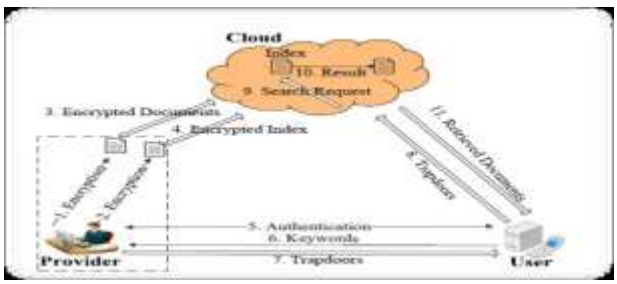

Fig No: 2 Encrypted data search implementation

4.1 Advantages

- The customary scrambled hunt design focuses on organize movement and pursuit time and traditional approach isn't relevant in versatile cloud conditions.

- A productive encoded information look plan to address these difficulties. This engineering incorporates a trapdoor pressure strategy to diminish movement costs, and additionally a Trapdoor Mapping Table (TMT) module and RSBS calculation to decrease look time.
- Save figuring and battery limits of cell phone.
- Bandwidth and vitality proficiency for information encoded seek plot, because of the spare battery life and payable movement expense.

V. Implementation: For trapdoor age, EnDAS stores a pre-registered Trapdoor Mapping Table (TMT) in cell phones, which maps normal English words to relating trapdoors. At the point when the cell phone starts an inquiry ask for, the trapdoor is gazed upward from the table as opposed to being asked for from the supplier. This streamlining spares one system round outing for the trapdoor age. A lightweight trapdoor pressure strategy is utilized to separate each trapdoors trademark bits[11], record and additionally gather area of every trademark bit all together and transmit the packed trapdoor to the cloud. Since these trademark bits just involve a little extent in this trapdoor, the packed trapdoor will prompt extra decreased activity cost for transmitting the trapdoors to the cloud.

5.1 Trapdoor Mapping Table Module

Building the trapdoor on the supplier side. In a conventional framework, the count of creating a trapdoor of a given catchphrase is constituted by term stemming, encryption and including commotion by the supplier. To lessen trapdoor development time, our technique sends the encryption procedure from the online way to deal with disconnected. Besides, the trapdoor age process uses a Trapdoor Mapping Table (TMT), which stores a lot of as often as possible utilized trapdoors (since an English vocabulary of only 3,000 words gives scope to around 95% of normal writings expect a legitimate size of catchphrases is around 3,000 words) computed disconnected. The key for this trapdoor mapping table is a term from stemmed catchphrases, while its esteem relates to encoded terms (an unadulterated trapdoor with no clamor).

Next we broke down the accessibility of the TMT module. As per our estimation, we found that in 20,000 trapdoors, the span of over 80% of trapdoors ranges from 20 to 60 bytes. That is, encoded catchphrases have a little size. So we chose 5,893 unique words (counting 3,000 regular words and 2,893 uncommon/unprecedented words [12]) as catchphrases to be scrambled, and after that put away those in TMT module although some uncommon words are not in the TMT module, clients once in a while look archives with them, and in this way we can completely overlook these words.

5.2 Retrofitted trapdoor age process

Retrofitted trapdoor age process, it isn't fundamental for a validated client figure unadulterated trap-entryways (which will bring about overwhelming calculation). After a catchphrase is stemmed, a client can simply question the trapdoor mapping table for the trapdoors, Since the trapdoor mapping table stores the data required for mapping and inquiry, the overwhelming calculation for creating trapdoors isn't should have been directed on the web. At that point the recently recovered or produced unadulterated trapdoor is included with a few commotions from a clamor set, to keep the cloud from looking at the same trapdoors[12].

5.3 Efficient Search Algorithm

Efficient search algorithm undergoes index construction of document, slicing, index encryption which improves the efficiency.

5.3.1Document Index Construction: The effective hunt calculation proposed by EnDAS depends on a double inquiry tree structure to quicken ordering. The customary protection saving file development techniques, including file development, list cutting and in addition list encryption and afterward expand our twofold inquiry tree development to quicken file coordinating .Finally we will show our RSBS calculation which use this information structure to perform security saving inquiries more efficiently The Term-Frequency (TF) lattice indicates the recurrence of each term in documents The grid A will be scrambled and outsourced to the cloud, as opposed to conventional TF network and IDF framework. This keeps away from augmentation activity (TF _IDF) while looking archives score in the cloud. Assume N archives and T terms, network A will be a N-by T framework. Every component RSt;c remains for the importance score of term t in report c, for a specific document, c 2 f1; : :Ng and a term t, t 2 f1; : ; Tg. We utilize the segment vectors Ic of lattice An as the file for a specific archive.

5.3.2 Index Slicing

After the plain-content report lists are delivered, the supplier at that point separates each file into s cuts (s _ T) as indicated by the score esteem. We expand this procedure as takes after. As indicated by score esteem, we isolate the file Ic into s cuts, and each cut has a standardized score esteem. Furthermore, terms in a single cut, for example, the cut Slicec [8], are given a same score an incentive as the standardized score of this cut.

5.3.3 Index Encryption: The supplier at that point scrambles each record with a given FAH calculation by encoding each list's cuts, previously sending them to the cloud. We construct our plan with respect to past protection saving looking frameworks. Here the FAH encryption calculation for report files is utilized. Using this FAH calculation, we encode cuts of each record. The definite encryption process for one Slicec of the file Ic is that scrambling l-bit term t in Slicec is utilized by the hash work H(), and mapping l-bit encoded term _t into r-bit improved term _ _t is by the mapping capacity G(), where l = d _ r; and afterward amassing all the r-bit upgraded terms together. At long last we get the scrambled cut Slice c. Along these lines, we can scramble the record Ic by collecting every one of the cuts (s cuts) and acquire the encoded file Ic rises to amassing all the advanced terms in this report, appeared as I0c = __1__2 : __T.

5.3.4 Binary Search Tree for Indexes

By using the FAH calculation, each record's file is handled as a hash code included by aggregated terms. With time, we can affirm if a given trapdoor shows up in this report. Assuming this is the case, we will additionally distinguish the cut inside the report, which contains the given trapdoor. To quicken the whole system, it builds a paired tree. In this information structure, the best level is a hash code contained by every single gathered term. On the second level, every relative just contains the gathered terms of half of the record. Additionally down, all relatives contain the collected terms of half of that from its parent. With such structure, the stature of the tree is at most s (the quantity of cuts in the list) and along these lines the hunt proficiency is O(s). The RSBS calculation expects to locate the best k reports that best match the pursuit catchphrases given by the client. To this end, it keeps up a score cluster for each record. The principle thought is to figure amassed scores for each archive and after that chooses the best k ones. Thus, RSBS has two layers of circles. The inward most part ascertains the score of a give catchphrase in a given record, with our paired inquiry instrument. The double pursuit will begin from the parallel tree we developed and drop to a cut that contains the catchphrase or find that the watchword does not show up in the archive. On the off chance that the watchword shows up in the report and refreshed to the Scores exhibit. Something else, a zero will be recorded.

5.3.4.1 Time many-sided quality investigation: The RSBS calculation crosses through all reports and all catchphrases in client's pursuit ask for, which makes the internal most body line iterated for eN times. Here e speaks to the quantity of catchphrases given by the client, and N speaks to the quantity of reports. In every emphasis, the parallel inquiry will be executed and its opportunity intricacy is O(log(s)) (s cuts in each list). In this way RSBS calculation has a period many-sided quality of O(eNlog(s)). Contrasting and conventional frameworks with a period intricacy of O(eNs). RSBS can viably diminish the hunt time by using the parallel inquiry. RSBS calculation can be additionally parallelized to register eN paired quests simultaneously, which could additionally lessen its real execution time.

5.3.5 RSBS Algorithm: After getting a trapdoor (encoded type of inquiry watchwords), the cloud would play out a security saving hunt from the records given by the supplier. At that point it chooses top-k archives that contain the given pursuit watchwords. This procedure is accomplished by utilizing the RSBS calculation Positioned Serial Binary Search (RSBS) calculation

Info: Noised trapdoors (one for every hunt catchphrase): T1… TC

Encoded archive records: A =i1… .iC

The quantity of reports to return: k

Yield: Top-k reports that best match the pursuit request: D = { D1,d2… ..Dk}

Stage 1: Scores = zeros(0;N)/make a variety of N zeros

Stage 2: for i:= 1 to N do

Stage 3: for n := 1 to e do

Stage 4: Score[i] + bsearch(Tn,1,si)/seek if

the catchphrase shows up in any of the s cuts of the record

Stage 5: end for

Stage 6: end for

Stage 7: arranged, files = sort (Scores)/sort the score exhibit furthermore, get the records or old component in the arranged exhibit.

Stage 8: D indices [0: k - 1]/get the best k records

Stage 9: return D

The RSBS calculation expects to locate the best k archives that best match the inquiry catchphrases given by the client. To this end, it keeps up a score exhibit for each archive. The primary thought is to register gathered scores for each archive and after that chooses the best k ones. Thus, RSBS has two layers of circles. The inward most part ascertains the score of a give watchword in a given report, with our parallel inquiry instrument. The paired pursuit will begin from the twofold tree we built and slide to a cut that contains the catchphrase or find that the watchword does not show up in the archive. In the event that the catchphrase shows up in the record and refreshed to the Scores exhibit. Something else, a zero will be recorded.

5.3.5.1 Time complexity analysis

The RSBS algorithm traverses through all documents and all keywords in user search request, which makes the inner-most body line iterated for eN times. Here e represents the number of keywords provided by the user, and N represents the number of documents. In each iteration[11], the binary search will be executed and its time complexity is O(log(s)) (s slices in each index). Thus RSBS algorithm has a time complexity of O(eNlog(s)). Comparing with traditional systems with a time complexity of O(eNs). RSBS can effectively reduce the search time by utilizing the binary search. RSBS algorithm can be further parallelized to compute eN binary searches concurrently, which could further reduce its actual execution time.

VI. Resultant Graph:

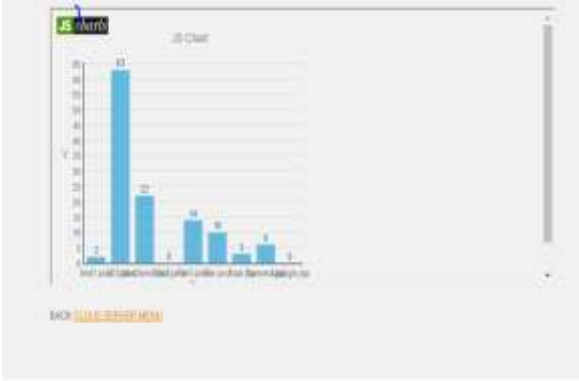

Fig: Data Access Rank Results

In the resultant graph x axis as name of the document/file, on y-axis as ranking of that file.

VII. Conclusion: A novel encrypted search system encrypted data search over the mobile cloud, which improves network traffic and search time efficiency compared with the traditional system. The analysis of the traditional encrypted search system and analyzed its bottlenecks in the mobile cloud: network traffic and search time inefficiency. Then it developed an efficient architecture of encrypted data search which is suitable for the mobile cloud to address these issues, where it utilized the TMT module and the RSBS algorithm to cope with the inefficient search time issue, while a trapdoor compression method was employed to reduce network traffic costs. Finally, the evaluation study experimentally demonstrates the performance advantages of encrypted data search

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