

Secure Data Sharing Using Mobile Cloud Computing

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Abstract

Cloud computing is another worldview in which registering assets such as preparing, memory, and capacity are not physically display at the client's area or maybe, an authority association has and manages these benefits, and customers get to them by methods for the Internet. Reports suggest that there are a couple of points of interest in moving figuring from the work region to the cloud. The basic necessities for flexible handling are confined imperatives and remote transmission limit. Distributed computing can give vitality reserve funds as a support of versatile client; however, it likewise represents some interesting difficulties. It gets figure cipher text policy attribute-based encryption (CP-ABE), a passage control advancement used in run of the mill cloud condition, yet changes the structure of access control tree to make it suitable for compact cloud circumstances. Secure information sharing moves an extensive portion of the computational concentrated access control tree change in figure content approach quality-based encryption from Personal Digital Assistants to outside middle person servers. The preliminary outcomes exhibit that sheltered data sharing can satisfactorily diminish the overhead on the mobile phone side when customers are sharing data in convenient cloud circumstances. The trial results demonstrate that safe information sharing can adequately lessen the overhead on the cell phone side when clients are sharing information in portable cloud conditions.

Keywords: Access control, cloud computing, computation offloading, data encryption and decryption, mobile computing

INTRODUCTION

Cell phones enable clients to run incredible applications that exploit the developing accessibility of implicit detecting furthermore, better information trade capacities of cell phones. As a result, versatile applications consistently coordinate with real time information streams and Web 2.0 applications, for example, mashups, open joint effort, long range interpersonal communication and versatile business [1, 2]. The versatile execution stage is being utilized for additional furthermore, more errands, e.g., for playing recreations; catching, altering, clarifying and transferring video; taking care of funds; overseeing individual wellbeing, miniaturized scale installments, ticket buy, cooperating with universal

processing foundations. Indeed, even cell phone equipment and versatile systems proceed to develop and to improve, cell phones will dependably be asset poor, less secure, with shaky network, and with less vitality since they are fueled by battery. Asset destitution is real impediment for some applications [3].

In this manner, calculation on portable gadgets will dependably include a tradeoff. Cell phones can be viewed as passage focuses and interface of cloud online administrations. As of late, has been talked about what distributed computing truly implies. Vaquero *et al.* contemplated more than 20 definitions utilizing the fundamental attributes related with distributed computing [4]. The distributed

computing worldview is frequently confounded about its capacities, portrayed as general term that incorporates practically any sort of redistributing of facilitating and registering assets. As indicated by NIST, distributed computing is a model for empowering advantageous, on-request arranged get to registering assets that can be quickly provisioned and discharged with insignificant administration exertion [5]. The blend of distributed computing, remote correspondence foundation, compact figuring gadgets, area-based administrations, versatile Web, and so forth., has established the framework for a novel figuring model, called versatile distributed computing, which permits clients an online access to boundless registering power and extra room.

Taking the disseminated figuring features in the adaptable space, we describe: "Flexible dispersed figuring is a model for clear adaptable development of PDA limits by methods for all-inclusive remote access to conveyed capacity and enrolling resources, with setting careful unique modifying of offloading concerning change in working conditions, while defending available recognizing and insight capacities of mobile phones." In our examination we consider splendid PDAs that join devices perpetually connected with the Internet, with handheld structure and a far reaching, choice plan appears and essential nevertheless, obliged preparing power. To make this vision a reality past clear organizations, compact circulated figuring has various impediments to endure. Existing disseminated figuring instruments handle simply express issues, for instance, parallelized planning on gigantic data volumes, versatile virtual machine (VM) the administrators or tremendous data amassing [7-9]. Regardless, these instruments give little help to adaptable fogs.

The most extreme limit of flexible cloud applications must be discharged, if count

and limit is offloaded into the cloud, yet without hurting customer instinct, introducing latency or then again obliging application potential results. The adaptable conveyed processing model needs to address the convenient confinements in advancement to supporting "limitless" enrolling capacities for applications. Such model should be suitable to different circumstances.

EXISTING SYSTEM

The current idea of mobile cloud computation still does the most picture situated handling on cell phones or maybe in cloud. Cloud additionally does not have the ability of recognizing the portable arrangement and its picture strong organization as for picture goals in order to diminish the general utilization of asset obliged vitality on download. Issues in the current framework, two principle concerns are portable distributed computing are restricted transfer speed and remote data transmission. Vitality effectiveness is a principal thought for cell phones. Circulated processing can save convenient client essentials yet the venture assets from offloading the figuring need to outperform the imperatives cost of the additional correspondence. In the present structure the essentials use will be even more in the midst of picture taking care of, and getting to ought to be conceivable speedier in cloud appeared differently in relation to the general existing system.

PROPOSED SYSTEM

In this strategy, picture offload calculation is done through same machine. The fundamental spotlight is on deciding if to offload calculation by foreseeing the connections among these three components. The prime investigation demonstrates that the vitality spared by calculation offloading relies upon the remote transmission capacity B , the measure of calculation to be performed C , and the measure of information to be transmitted D . This versatile picture sharing administration empowers portable clients to transfer pictures to the mists on

client demand. Clients may get to all pictures from any gadgets. With the cloud, the clients can spare impressive measure of vitality and extra room on their cell phones since all pictures are sent and prepared on the mists according to the cell phone similarity. In the process picture information is all around verified through standard encryption and decoding calculations to keep up respectability and security of delicate information on cloud.

METHODOLOGY

The noteworthy favorable position of Cloud Computing for phones is the ability to run applications between resources constrained contraptions and Internet-based Clouds. Therefore, asset obliged devices can redistribute estimation/correspondence/resource genuine exercises to the Cloud. The main motivation of offloading is to achieve less execution time and less essentialness usage inside versatile devices. This portion intends to include the norms behind three structure models of MCC [13].

Cloud Server

Compact cloud preparing means to draw out the capacities of limit/estimation confined devices and to give reliable access to data/application on a remote resource rich server from wherever. A remote cloud server goes about as an organization provider to mobile phones. The framework arrange from the device to the cloud server ought to be upgraded to ensure the idea of organization and predictable handover. With the term of "No Cloud without Virtualization", to diminish the taking care of time additionally, improve the beneficial imperativeness, there are many existing courses of action that assistance this plan by using the virtualization system, for instance, virtual machines-based, compartment-based virtualization.

Cloud Computing

CC is another strategy for giving figuring resources and organizations. It suggests an on-demand system that licenses customers

to get to enlisting resources at whatever point from wherever. CC offers to customers and business three guideline focal points: tremendous handling resources available on intrigue, portion for use as required and on a flitting premise, and improved IT the board and upkeep limits. CC gives clients with different applications as organizations through the Internet. As occurrences of open CC, we can list Windows Azure and Amazon Web Services (AWS). Windows Azure is an open and versatile cloud organize which gives a couple of organizations to make, send and run web applications and organizations in cloud data centers. AWS which is considered for example of an open preparing instrument, gives customers two models: structure as an organization and programming as an organization. These organizations license the customer to use virtualized resources in cloud server ranches. Computational fogs realize a collection of organization models in solicitation to use them in different enlisting dreams.

Mobile Cloud Computing

MCC can be seen as a framework that fills the gap between the confined enrolling resources of Surface Mount Devices and getting ready essentials of focused applications on SMDs. The mobile cloud computing forum describes MCC as seeks after "Mobile cloud computing in any event complex structure insinuates an establishment where both the data amassing and the data dealing with happen outside of the phone. Convenient cloud applications move the handling force and data amassing a long way from PDAs and into the cloud, bringing applications and adaptable preparing to not just mobile phone customers anyway much progressively broad extent of flexible endorsers". MCC has pulled in the thought of operators as a valuable and supportive business course of action that confines the headway and execution costs of versatile applications, empowering convenient customers to verify latest advancement accommodately on an on-demand premise.

Computation Offloading

Estimation offloading is the errand of sending figuring concentrated application sections to a remote server. Starting late, different computation offloading frameworks have been proposed with a couple of systems for applications on adaptable devices. These applications are distributed different granularity levels and the portions are sent (offloaded) to remote servers for remote execution in order to grow and improve the SMD's abilities. Nevertheless, the figuring offloading instruments are so far going up against a couple of troubles.

LITERATURE SURVEY

Around there, we present the examination of imperatives capability over MCC approaches. Since, phones have confined computational resources; there is a necessity for offloading of counts to the Cloud. The IoT has the purpose behind giving an IT-system empowering the exchanging of "things" in a secured and strong way, for instance its ability is to overcome the opening between articles in the physical world and their depiction in information structures [1]. Setting care, as an inside component of unavoidable additionally, certain handling systems, has existed and been used since the mid-1990s. The accentuation on setting careful enrolling progressed from work territory applications, web applications, versatile figuring, and inevitable/inescapable preparing to the Internet of Things (IoT) all through the latest decade [2].

Disseminated registering is an untouchable with broad scale amassing servers and server ranches used to give structures, programming improvement and appointment stages with low expenses in the preparing advancement. Disseminated registering in addition engages adaptable on-demand organizations to the customers. In this way, flexible applications over Cloud enlisting can be immediately provisioned and released with insignificant undertakings of organization providers and the officials [3]. Together with an insecure

improvement of the adaptable applications and ascending of appropriated figuring thought, convenient conveyed processing (MCC) has been familiar with be a potential advancement for flexible organizations. MCC arranges the appropriated figuring into the adaptable condition and annihilations obstacles related to the execution, condition, and security discussed in convenient preparing [4].

Flexibility fills the weight among independence and resource poor concerning static parts. Affiliation that is typical for all coursed systems. The relative resource destitution of adaptable segments. This investigation was supported by the air force materiel command similarly as their lower trust and power battles for (AFMC) and ARPA under contract number F196828-93-C-0193. Reliance on static servers [5]. Regardless of growing utilization of compact enrolling, abusing its most extreme limit is troublesome due to its natural issues, for instance, resource deficiency, visit detachments, and flexibility. Flexible conveyed processing can address these issues by executing convenient applications on resource providers external to the wireless [6]. Offloading is a strategy of migrating estimations to dynamically sharp systems like Cloud conditions for dealing with and recuperating the results to mobile phones. Thusly, this zone gives the examination of offloading plans with their controls towards imperativeness productivity. A flexible offloading plan was proposed, Wu, Huaming *et al.* to check for a keen Cloud server with an essential regard on interest for a predefined phone [7]. In this strategy, the computations occur in a Cloud server and the results are sent to the PDA to save imperativeness while improving the mobile phone exhibitions.

Hiraz *et al.* the makers used a couple of correspondence progresses for offloading the data between mobile phones what is more, the cloud [8]. A couple of undertaking

execution parts were considered, for instance, neighborhood, offloading from wearable to mobile phone or cloud. The Wi-Fi based correspondence gives favored results over LTE development in regards to time v/s consumption. Because the above techniques considered offloading instruments without watching out for the overhead of portions for development at runtime, the makers, Shojafar proposed an appropriated energy efficient computational offloading structure (EECOF) for MCC [9]. This framework moves computationally genuine portions to the Cloud centers at runtime. This has incited the diminishing of data transmission rate additionally, essentialness usage while offloading estimations to MCC. Xia, Feng, a dynamic resource provisioning scheduler was proposed for MCC offloading that commonly confines the usage of imperativeness over estimations and exchanges [10]. The makers considered parameters like execution time, incredible put and information transmission usage to survey the proposed count with existing strategies.

This booking (dynamic weight changing and online occupation crumbling) should be possible by suing electronic virtual server ranches for flexible resource the officials. Nevertheless, this model relies upon TCP/IP. Phone2Cloud is another essentialness saving method by offloading adaptable application computations to the Cloud [11]. It offloads all or some segment of running applications to the Cloud to diminish essentialness usage and execution time while improving customer's association (for instance customers delay tolerant experience). T. Le Vinh *et al.* the creators arranged a numerical model for addressing headway issue for imperativeness efficiency [12]. We proposed a free plan tradition that grants dynamic execution of uses subject to the blend of clients and servers. We used a weight procedure to transmit data to the Cloud. The association models join offloading instruments similarly as customer/server models.

In conveyed figuring mobile phones are used to store/recoup singular data and definitive data from wherever at whatever point. Consequently, the data security issue in adaptable cloud ends up crueller and neutralizes further improvement of compact cloud. Today data security issue is one of most significant issue in the cloud [13]. Distributed figuring is a consequent advancement from various fields of enlisting. The thought focal point of cloud figuring is to get organizations and dealing with cutoff over the Internet. This development reduces cost, increase storing, modernize structures and present flexibility and convey ability of information. Various progressions have been ascended out of the appropriated registering, for instance, compact conveyed figuring [14]. Convenient figuring is at a convergence. Following two numerous long periods of proceeded with effort by various masters, we have finally developed the inside thoughts, frameworks, and segments to give a solid foundation to this still rapidly creating area [15].

RESULTS

To experiment on this work, we have used two devices to implement four discussed mobile cloud computing based architectures. From the below examination, we can plainly say that the Mobile Cloud computing expects to enable the versatile client to conquer its overwhelming works by giving a consistent and rich usefulness notwithstanding the asset constraints of cell phones. Although mobile Cloud computing becomes the future dominant model for mobile applications.

Input Design

The information arrangement is the association between the information system and the customer. It contains the making assurance and techniques for data game plan and those methods are critical to put trade data in to a usable structure for getting ready can be practiced by researching the PC to scrutinize data from

a created or printed record or it can occur by having people entering the data direct into the system [13]. The structure of data bases on controlling the proportion of data required, controlling the slip-ups, avoiding deferment, keeping up a key separation

from extra methods and keeping the system clear. The data is organized in such a route along these lines, that it outfits security and ease of use with holding the insurance (Figure 1).

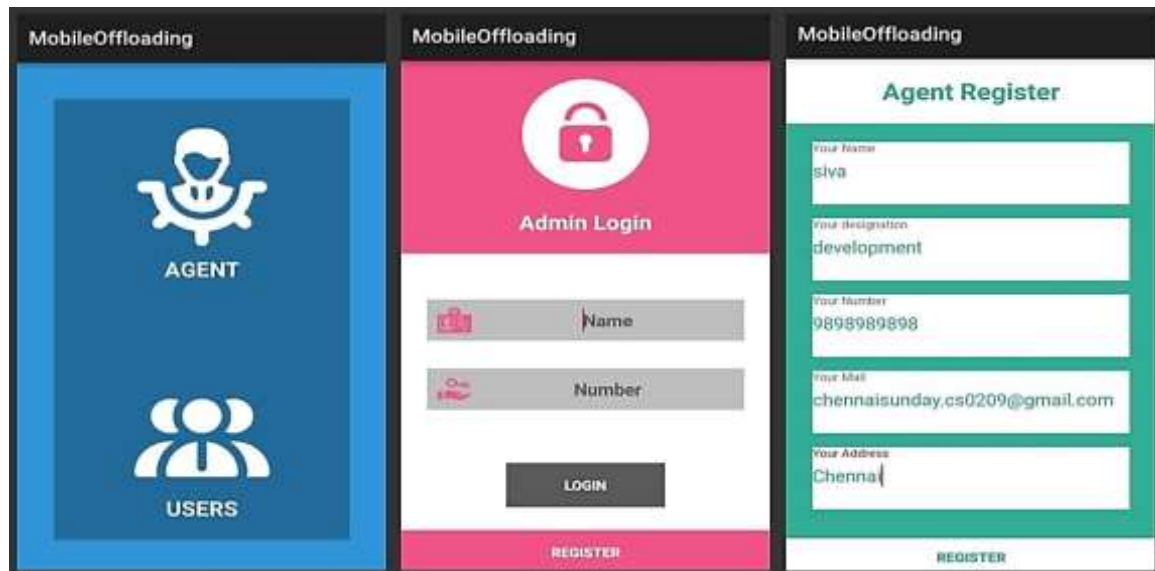


Figure 1: User login and registration.

Security and Privacy in Mobile Cloud Applications

Security of information transmission is a critical worry in cloud-based application handling. Security and protection are two vital ideas that should be kept up amid the offloading process. These ideas can be tended to from various points: (1) Mobile gadget, (2) cloud server farms, and (3) amid information transmission over the system. Other than every one of the advancements, there is an extraordinary increment in the assortment of advanced assaults on cell phones which are the fundamental focuses for assailants. Concerning security in the cloud server farms, dangers are fundamentally identified with the transmission of information between the diverse hubs over the system. In this manner, abnormal states of security are normal by both the versatile customers and the cloud suppliers. In the present systems, paired exchange of the application code at run time is consistently oppressed to security dangers [10, 12]. In

spite of the accessible arrangements, solid measures and a protected domain are required for the three elements of MCC demonstrate.

In the creator's center around improving assignments and calculations, what is more, they investigate secure offloading of pertinent straight programming (LP) calculations. In this paper, creators manufacture their work dependent on the deterioration of the LP calculation offloading into open LP solvers running on the cloud and private LP parameters claimed by the client. To accomplish a productive furthermore, approve results, the creators center around the essential duality hypothesis of LP calculation and come up with the basic conditions that must fulfilled by right results. Bugiel *et al.* present in engineering for secure re-appropriating of information and self-assertive calculations to an untrusted item cloud. The design proposed in their methodology comprises of two mists

(twins): a confided in cloud what is more, a product cloud.

The calculations are separated so that the trusted cloud is fundamentally utilized for basic activities, though demands to the offloaded information are prepared in parallel by the quick product cloud on encoded information. In any case, separating activities and dealing with them by various mists lead to various challenges. For example, the arrangement

and upkeep of this design of cloud will require clear changes in the principle framework. The security danger is progressing in a brisk way more than we can stay aware of it. Security procedures need to improve and advance always to meet new changes and new offered administrations. Along these lines, it is never again conceivable to characterize a security framework that would settle all the security dangers at once (Figure 2).



Figure 2: Mail received from server side.

Downloading and Sharing Files

In every module, we can download the particular PDF, word, picture or PPT. From the server side in which every module will list the accessible records which the server shared and from that point we can download the documents and store it in their gadgets. Before reaching the server, the aide should enroll himself through the application and thus the server will send affirmation of username and secret phrase to him. We need to utilize it for downloading the documents from the

server. Here, the two android mobiles will impart by accepting documents the aide will go about as the sender and the other portable will go about as the recipient. Therefore, on association the collector portable needs to give the location of the sender versatile as the information. So, we will interface and on association the record will be send. The sender needs to make reference to the document name to send the record. So, the exchanging of documents is finished (Figure 3).

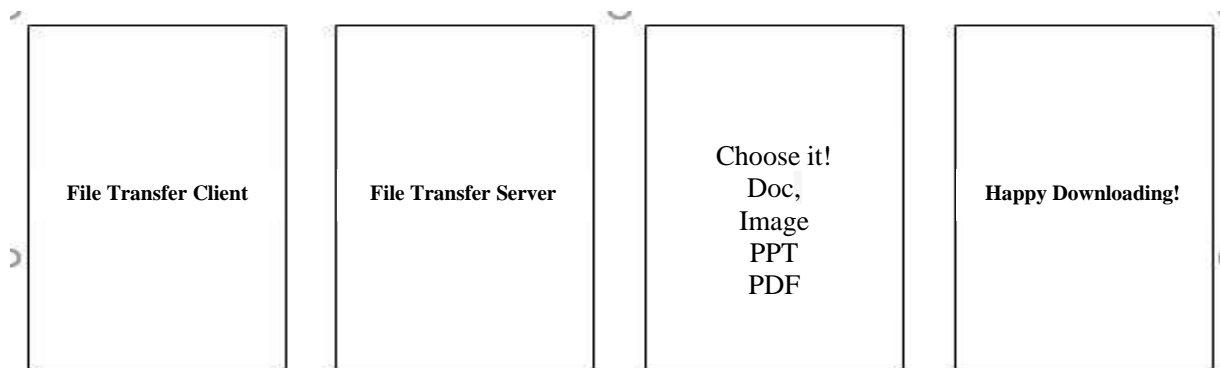


Figure 3: Downloading and sharing files.

Image and Data Request

Every one of the records are in encoded group. Client cannot see the records without know the secret word. For view the record first client need to demand the secret word to trusted authority, the authority check the client and give the

secret word to substantial user. Image demand is additionally same as the text request. The rundown of pictures can see in the application. In any case, client can just view the pictures in the wake of getting the secret phrase from confided in power (Figures 4 and 5).



Figure 4: Image and data request.

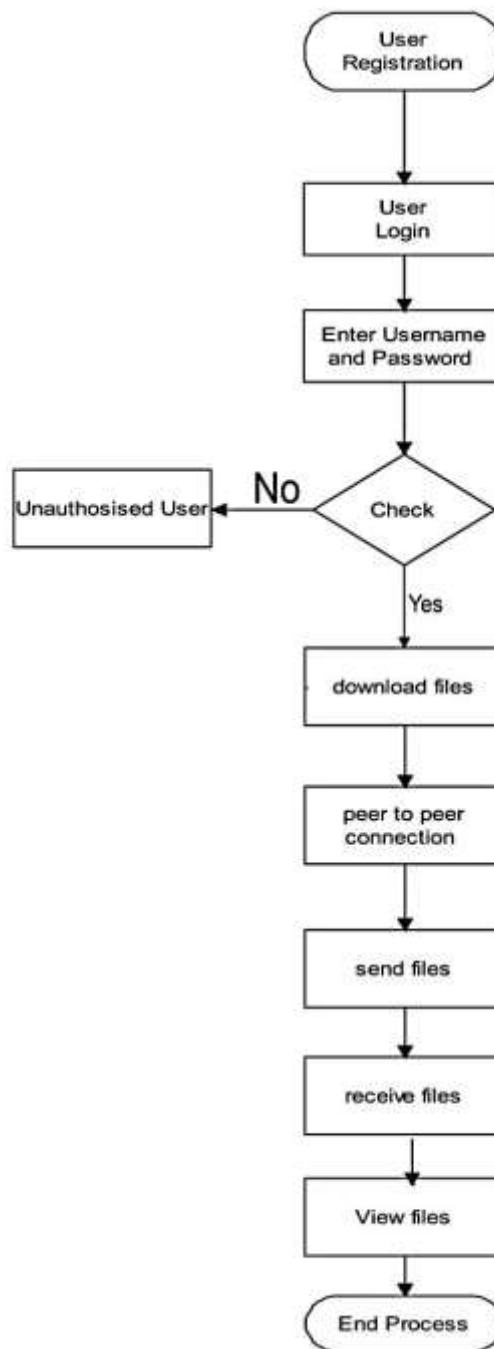


Figure 5: Data flow diagram of mobile cloud computing.

Encryption and Decryption

In this module, client encoded the plain content to scrambled organization and transferred to the cloud [14]. The encryption is finished by utilizing a secret phrase. Just utilizing this secret word just any one can decode the content. The client transfers the secret phrase additionally incorporates with encoded information.

The confided in power is in charge of passing the secret key to the mentioned client. Like equivalent to the picture encryption is likewise done. Furthermore, the scrambled pictures and secret phrase will likewise be transferred to the cloud. The confided in power is in charge of passing the secret phrase to the mentioned client (Figure 6).

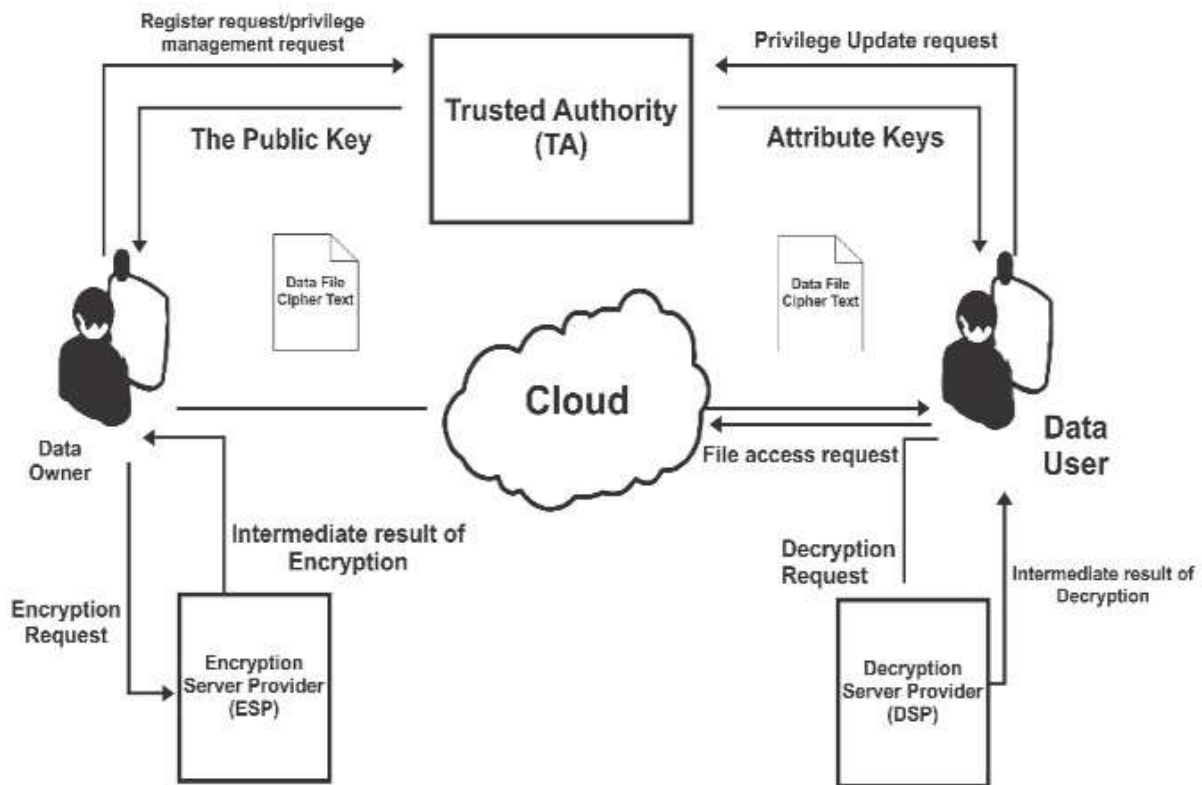


Figure 6: Encryption and decryption.

Any client can see the record transferred in the server. Every one of the records is in encoded design. Client cannot see the documents without know the secret key [17, 18]. For view the document first client

need to demand the secret key to trusted authority the authority check the client and give the secret word to legitimate user. Image demand is likewise same as the text request (Figure 7).

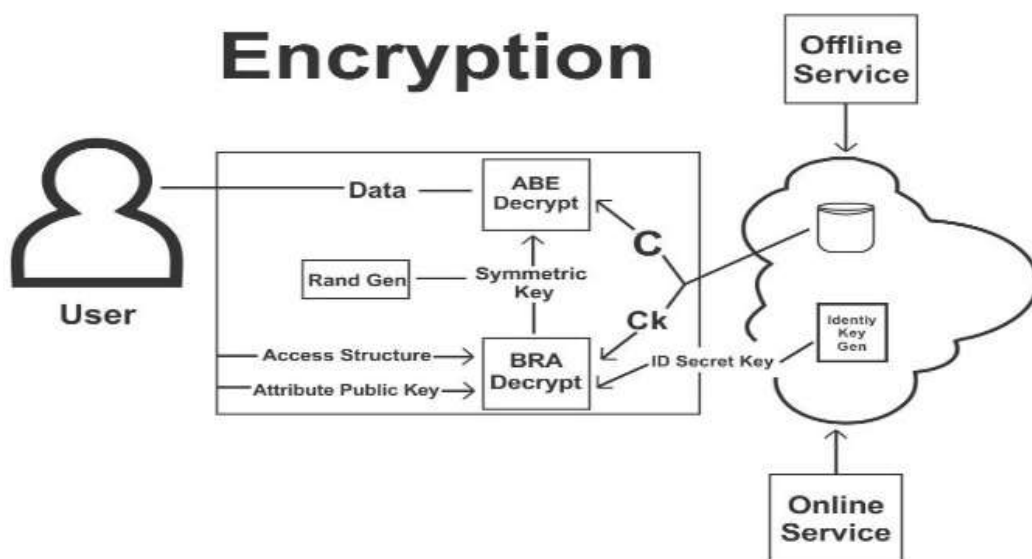


Figure 7: Encryption.

The rundown of pictures can see in the application. In any case, client can just view the pictures in the wake of getting the secret phrase from confided in power. The client transferred scrambled information can be seen in the server side. The believed specialist go about as server we have the obligation to give secret key to the mentioned client. After client sees the scrambled information,

we can demand the secret key for encoded information. This client solicitation can be seen in the trusted authority [16]. After that see the solicitation trusted specialist approving the client and if the client is legitimate the trusted expert give secret phrase to the mentioned record by means of email. Utilizing this secret key client can unscramble the record (Figure 8).

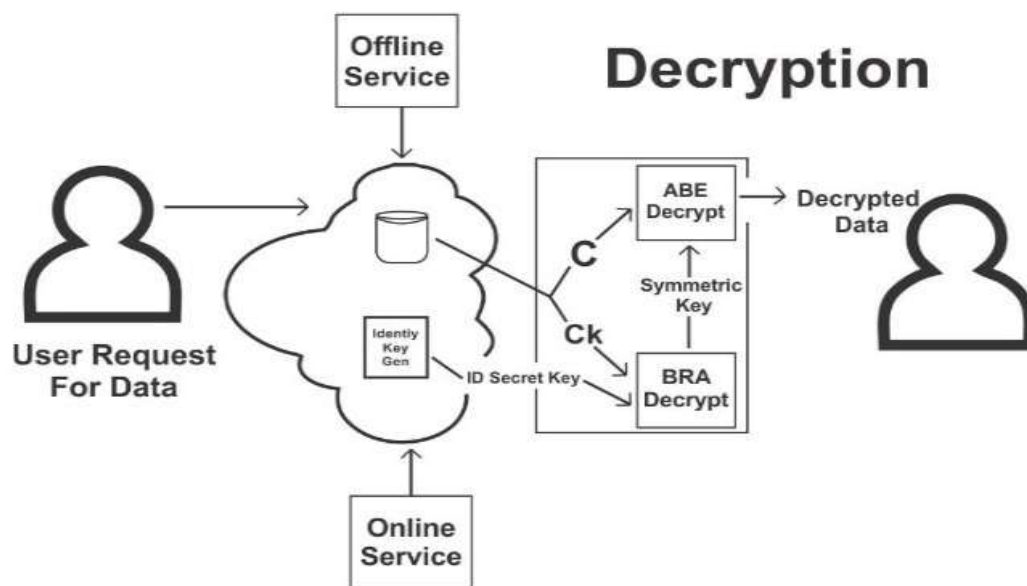


Figure 8: Decryption.

Proposed System Algorithm

Step-1: Start

Step-2: Accept the data from the user.

Step-3: The Attributes of the information from the clients' configurations are acquired by the Attribute-Based Encryption.

Step-4: With the assistance of these Attributes, Random Key is created, and kind of information is gotten for encryption by BRE calculation.

Step-5: The data is converted into equal number of blocks and $N \times N$ matrix will be generated on the basis of these blocks.

Step-6: Based on no. of blocks, pool of threads will be created.

Step-7: Run the threads in multi core system to create encrypted data in short amount of time.

Step-8: A secret key is generated in order to open the encrypted file which is stored in the cloud.

Step-9: The secret key is shared to the user via email or mobile number of the authorized user. This key will be used to decrypt the encrypted file.

Step-10: The document chosen will be decoded in the first structure utilizing the key.

Step-11: Stop.

OBJECTIVES

- Information design is the way toward changing over a client situated depiction of the contribution to a PC based framework. This plan is critical to keep away from mistakes in the

information input procedure and demonstrate the right bearing to the administration for getting right data from the automated framework.

- It is accomplished by making easy to use screens for the information passage to deal with substantial volume of information. The objective of planning input is to make information passage simpler and to be free from mistakes. The information section screen is structured so that every one of the information controls can be performed. It likewise gives record seeing offices.
- At the point when the information is entered it will check for its legitimacy. Information can be entered with the assistance of screens. Fitting messages are given as when required with the goal that the client would not be in maize of moment. In this manner the target of information configuration is to make an info format that is anything but difficult to pursue.

DISCUSSION

A quality yield is one, which meets the essentials of the end customer and presents the information obviously. In any framework consequences of handling are imparted to the clients and to other framework through yields. In yield plan it is resolved how the data is to be uprooted for prompt need and furthermore the printed copy yield. It is the most imperative and direct source data to the client. Offloading is characterizing as a technique that relocates assets concentrated calculations from a cell phone to the asset rich cloud, or server (called close-by framework). Cloud based calculation offloading improves the application's execution, diminishes battery control utilization, and execute application's that are unfit to execute because of inadequate advanced mobile phone assets. Moving all information and processing assets to the cloud can have suggestions for privacy and security (Figure 9) [11].

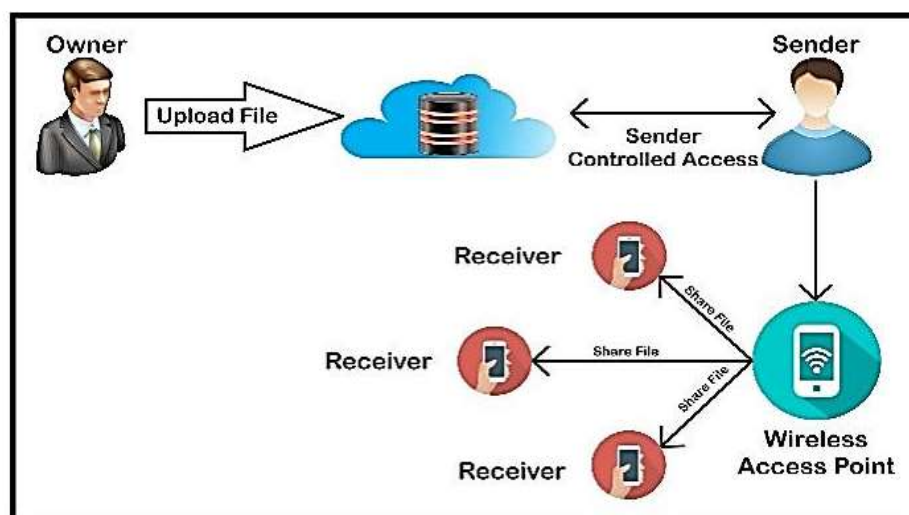


Figure 9: System architecture.

The information is put away and oversaw in the cloud, security and protection setting rely upon the IT the executives the cloud gives. In every module, we can download the particular PDF, word, picture or PPT [12]. Every module will list the accessible records which the server shared and from

that point we can download the documents and store it in their gadgets. In this module client encoded the plain content to scrambled configuration and transferred to the cloud.

The encryption is finished by utilizing a secret phrase. Like equivalent to the

picture encryption is likewise done. Furthermore, the scrambled pictures and secret word will likewise be transferred to the cloud. Every one of the records are in scrambled arrangement. Client cannot see the documents without know the secret key. For view the document first client need to demand the secret key to trusted authority. The authority checks the client and gives the secret key to legitimate client.

BENEFITS OF MOBILE CLOUD COMPUTING

Versatile cloud applications move the registering force and information stockpiling far from cell phones and into the cloud, bringing applications and portable figuring to Smartphone clients as well as a lot more extensive scope of portable supporters. In this segment, we enroll the conceivable advantages of mobile cloud computing.

- Mobile cloud computing will defeat restrictions of cell phones specifically of the preparing force and information stockpiling.
- It additionally may expand the battery life by moving the execution of substitution concentrated application 'to the cloud'.
- Mobile cloud computing is additionally observed as a potential answer for the divided market of versatile working frameworks with right now eight noteworthy working frameworks.
- Mobile cloud computing can expand security level for cell phones accomplished by an incorporated checking and upkeep of programming.
- It can likewise turn into a one-quit shopping choice for clients of cell phones since mobile cloud operators can all the while go about as virtual system administrators, give e-installment benefits, and give programming, information stockpiling, and so forth as an administration.

- A number of new specialized functionalities may be given by versatile mists. Specifically, provisioning of setting and area mindfulness empowers personalization of administrations is an appealing usefulness.
- Mobile cloud computing may open the distributed computing business that is right now only tending to organizations to purchasers since we will altogether profit by the above portrayed choices.

CONCLUSION

In this paper, we have secured a few delegates versatile cloud approaches. A lot other related work exists, however, the reason for this paper is to give a review of the wide range of versatile distributed computing conceivable outcomes. None of the current methodologies meets totally the prerequisites of portable mists. Local (disconnected) and Web (on the web) applications are the two limits of portable applications. The previous sort is utilizing abilities of cell phones, yet the mix with the cloud is poor. The last sort needs from lacking use of cell phone sensors and accessible gadget registering assets while experiencing intelligence issues. In this way, we trust that the maximum capacity of portable cloud applications lies in the middle of these two limits, while powerfully moving the obligations between cell phone and cloud. A few scientists have appeared at accomplish that by, e.g., duplicating entire gadget programming picture or offloading portions of the application. The offloading can happen to some remote information focus, adjacent PC or group of PCs, or even to adjacent cell phones. Besides, because of the temperamental versatile situations, numerous components should be joined in an expense model, and quick prescient advancing calculations settle on the best application execution. To streamline the advancement a helpful, yet compelling, programming deliberation is

required. Versatile distributed computing will be a wellspring of testing research issues in data and correspondence innovation for a long time to come. Taking care of these issues will require interdisciplinary research from frameworks, systems, and HCI.

FUTURE SCOPE

Appropriated registering and related organizations are getting a vast expanse of advancement into the way in which we mastermind process and eat up information. A consistently expanding number of associations transversely over various ventures are as of now going the 'cloud' way and are mentioning more changed courses of action from organization suppliers. Numerous people envision that conveyed processing is only money saving mechanical assembly as is being foreseen in different endeavors to sell something. Its handiness reaches out past this. It incorporates adaptability, extends benefit, offers access to later advances and pushed establishment, and improves operational efficiency. Shrewd business is tied in with understanding creating progresses and after that choosing their impetus for the customer. Also, we make reasonable procedures in using this advancement for their leeway. We all in all understand that "conveyed processing" is the new stylish articulation in the market. You ought to just comprehend is the way by which your business systems can profit by it.

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