RESEARCH ARTICLE OPEN ACCESS

Various Techniques of Energy Consumption On Cloud Network- A Survey

Priya Dubey[1], Saurabh Jain [2]
M.Tech Research Scholar [1], Asst. Professor [2]
Computer Science Engineering
Oriental College of Technology
Bhopal - India

ABSTRACT
Cloud computing is the stage for a choice of services like software, infrastructure as a cloud service and each person wants to have the benefit of that cloud services using the cloud computing concept, which ultimately increases the data size and loaded records on cloud servers. Due to increased number of files on the cloud database the retrieval of files becomes much more time consuming and complex. Also this file retrieval doesn't ensure the exact retrieval of files from the storage. Besides, the isolation apprehension affect to the appropriate documents regained by the cloud user in the afterward phase in view of the fact that they may also enclose sensitive data and make known information about sensitive exploration words or phrase. Here in this paper an efficient approach of power consumption using scheduling of resources is implemented.

***Keywords*:-** Cloud, Security, Multi-Keyword, Cloud Computing.

I. INTRODUCTION

Cloud Computing means a remote server that access through the internet which helps in business applications and functionality along with the convention of system software for respective web application. Cloud computing concept saves capital that cloud users pay out on annual or monthly payment. Due to benefit of cloud services, more and more perceptive information are being centralized into the cloud servers, such as secret videos and photos, various emails, personal health records information, corporation business data, government documents, etc. So as to privacy problem, data privacy [1] and data loss will be increase in certain circumstances. When users outsource their private onto cloud, the cloud service provider able to monitor the communication between the users and cloud at will trust or untrusted. As cloud computing is promising development in computing concept the confidence increase becomes very important aspect. There are mainly two parameters which can help to get better the confidence on the cloud services. One is to recover efficiency and another for improving security. To progress the effectiveness the keyword explore method is enhanced as it makes available two way communications between cloud server and the cloud customer. But while deploying security the burden on cloud server gets increased unexpectedly. Accordingly it is extremely significant to maintain these two factors so that to improve overall efficiency of the cloud services [2]. Also the world is of mobile devices, so everybody wants to use cloud services on their mobile devices and if the computational cost goes to elevated then it effects into important resource utilization, which is not appropriate for mobile devices. So current scenario is having need of a proficient method is cloud services in the expectations.

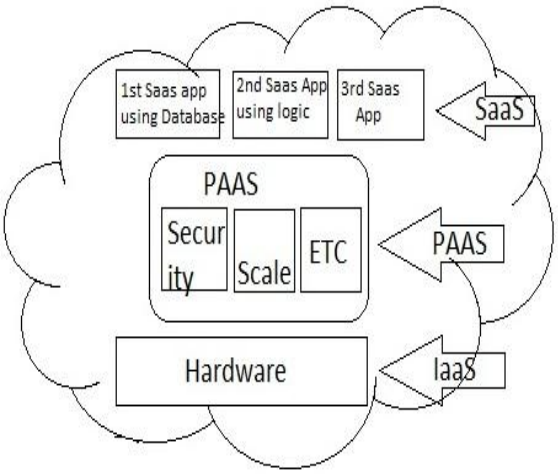

Fig. 1. Architecture of the Cloud Computing

Cloud is a service which can be accessed from everywhere if arranged in that way at any path. It causes lots of parties or persons using it for their purpose. In such case the data Various parties may contribute to within them on the cloud server can be secret. In addition every cloud user who uses cloud services doesn't like to get followed. In such cases it is very important to maintain their privacy [3]. Thus to maintain their privacy the files and even the search requests are encrypted as soon as the request is sent to the server. This encryption can also affect the effectiveness of searching techniques as the search should go on in encrypted manner.

Besides, in cloud computing data owners may allocate their outsourced data with a number of cloud users, who strength want to only get back the data files they are paying attention in cloud server. One of the most fashionable ways to do so is throughout keyword-based retrieval. It is like better to get the retrieval outcome with the most significant content of the users which matches with the ranked in order to fill the user's interest. To develop security exclusive of give up effectiveness, methods here in [4], [5], give you an idea about that they sustain top-k single keyword retrieval under different circumstances. To protect data privacy, confidential data has to be encrypted before outsourcing, so as to give end-to-end data confidentiality assurance in the cloud. Clouds enable clients to remotely store and access their data by lowering the cost of hardware ownership while providing robust and fast services [6]. The importance and necessity of privacy preserving search techniques are even more pronounced in the cloud applications. Due to the fact that outsized companies that operate the public clouds like Google or Amazon may access the sensitive data and search patterns, hiding the query and the retrieved information has great importance in ensuring the privacy and security of those using cloud services. We aim to achieve an efficient system where any authorized user can perform a search on a remote database with multiple keywords, not including exposing neither the keywords he/she searches for, nor the pleased of the documents he/she get backs. The main confront of cloud storage is guaranteeing have power over, and the essential integrity and confidentiality of all stored cloud data.

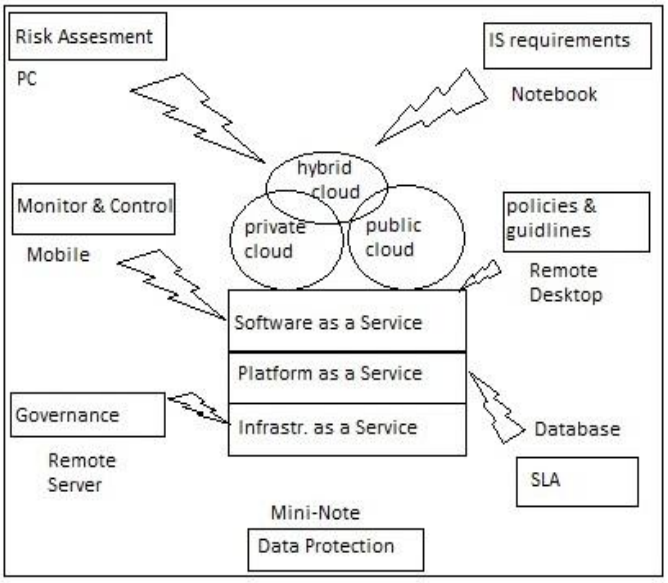

Fig. 2. Various Models of Cloud Computing

Benefits of Cloud Computing

- Although the infrastructures under the cloud are much more powerful and reliable than personal computing devices, they are still facing the broad range of both internal and external threats for data integrity.
- Second, there do exist various motivations for CSP to behave unfaithfully toward the cloud users regarding their outsourced data status.
- In particular, simply downloading all the data for its integrity verification is not a practical solution due to the expensiveness in I/O and transmission cost across the network. Besides, it is often insufficient to detect the data corruption only when accessing the data, as it does not give users correctness assurance for those unaccessed data and might be too late to recover the data loss or damage.
- Encryption does not completely solve the problem of protecting data privacy against third-party auditing but just reduces it to the complex key management domain. Unauthorized data leakage still remains possible due to the potential exposure of decryption keys.

II. LITERATURE REVIEW

2014- A. Q. Lawey et. al. they introduced energy efficient cloud computing services design framework

over IP/WDM core networks. They analyzed distribution of clouds, impact of demand, cloud capability, access frequency content popularity along with no. of switches, routers, servers, and storage required in cloud [7]. They examined cloud content delivery, virtual machines and storage as a service (StaaS).they developed mixed integer linear programming (MILP) to enhance services of cloud content delivery by replicating content into multiple clouds on which they developed energy efficient cloud content delivery heuristic DEER-CD. They increased power savings by migrating content according to access frequency and by optimizing placement of virtual machines by breaking them into smaller virtual machines and placing them in proximity. They termed replicating content into multiple clouds based on content popularity as OPR scheme. With the help of these schemes they were able to save 92% and 43% network and total power savings respectively. They obtained power savings are by placing Virtual machines using a heuristic (DEER-VM) developed to copy the model behavior in real time [7].

2014 – V. Mathew et. al. identified the operational costs of Internet scale distributes systems(IDS).they proposed a demand response technique in which pricing signals from smart grid makes the system to reduce energy usage [8]. The load is deferred from elastic requests to later time periods reducing server demand and energy usage. They proposed optimal offline algorithm and showed that cost savings can be achieved without increasing in bandwidth cost of IDS .the approach used by them for elastic requests like background downloads, software updates etc. does not require continuous services. The algorithm proposed by them achieved 12% of savings on time of use electricity pricing. They presented a future plan to move load to near data centers for energy saving [8].

2013- S. Zaman et. al. analyzed that the cloud computing resources were provisioned to different virtual machine instances allocated to users for specific period of time which is not efficient allocation economically due to fixed price allocation [9]. They proposed combinatorial auction based allocation which described that user's demand is taken into account while making provisioning decisions and VM allocation because the existing mechanism do not consider user's demand. They evaluated the mechanism through simulation experiments which improved utilization of resources of clouds and increased the revenue of cloud provider. They designed mechanism CA-PROVISION which

S. No.	Writer	Method	Parameters	Results
1	T.H. Szymanski [12]	They explored the technology to achieve efficient energy communications in cloud computing systems. The cloud computing system is global scale as stated which can link 100 data centers and can interconnect 5M servers larger than HPC machines.	Delay with respect to excess bandwidth, End to End Delay Bounds for Aggregated ON/OFF Traffic Streams, Maximum Flow and Minimum Energy.	They used inter-processor communications onto trunks for improved and efficient latencies, bandwidth and energy. They proposed that cloud computing system can be more efficient in energy and resource utilization by low latency connections and multithreading
2	F Chen et. al. [13].	They stated the large amount of energy consumed by large cloud data centers producing carbon footprints. They gave the idea to minimize energy consumption guaranteeing service level agreements (SLA)	Cloud Server Power with respect to CPU Usage, Energy Consumption, Throughput with No. of Cores Allocated.	The proposed methodology implemented here provides less power consumption and energy as well as provides maximum CPU Utilization.
3	H. Chihi et. al. [14]	They remarked that cloud computing can be used for distributed utility computing and can save energy through central management of computational resources like	SLA Status, Memory, Storage, CPU Cores, Number of VM's, Number of Data Centers, Consumed Energy.	Low power consumption as compared for various test scenarios.

		power down servers when not in use. They proposed an approach on unsupervised predictor model in form of unsupervised		
4	Y. Tang et. al. [15]	They designed FADE to secure this data backup through policy based access control and file assured deletion. FADE is capable of associating backup files with access policies and deletes them on policies revocations. They designed FADE to work atop cloud storage services which is set upon cryptographic key operations providing security.	Storage Cost and Power Consumption	Efficient usage of storage and takes less power consumption.
5	J. Wang et. al. [16]	They proposed a strategy to reduce energy consumption in cloud computing servers by dynamically monitoring the requests at finite time period and then switching servers according to requests. They maintained QoS levels, backlogging and unit penalty cost to monitor computational performance. They developed stochastic integer programs to reduce energy consumptions through scheduling uncertain requests	Average Job Requests during a day as ratio of the maximum capacity of all services, Time based models, The operational cost.	Less power consumption and provides more jobs request.

Table. 1. Literature Review

Effectively captured market demand, provisioned the computing resources and generated higher revenue as compared to CA-GREEDY [9].

2013- K. Qazi et. al. observed that virtual machines(VM) rent computational resources like memory, network bandwidth etc. to data center owners [10]. They stated that the physical machine that make up cloud termed as machine farms should optimally use these resources without being overload at a point and also minimum machine should continue running. They observed the pattern to help arrange the VM on physical machines. They proposed a framework PoWER that predicts the behavior of cluster and distributes VM in cluster turning off unused physical machines to save energy. They tested PoWER on tested cluster and analyzed its performance resulting in better results compared to FFT based time series method [10].

2013- G. Lahoti et. al. stated that fine grained energy usage data can leak customer information and due to use of this data by online service providers for effectiveness of smart grid technologies ,the sharing of data is increasing [11]. They proposed privacy enhanced framework to store, manage and share such data. The mechanism used by them stated that the customer can control the usage information showing to service providers which will be convinced by its authenticity. They implemented a prototype using Green Button data model. Their prototype worked allowing redaction of Green Button data model while sharing data with third party service provider. The presented data can be used for billing and accounting purpose as it can be authenticated and verified by third party using Green Button data model. They planned to work on the working prototype of the model of demand response aggregation service [11].

2011- D. G. doLago et. al. they proposed a virtual machine scheduling algorithm based on concepts green computing. The proposed algorithm by them minimizes the energy consumption in task executions in cloud environment by shutting down underutilized hosts, migrating hosts that are operating below threshold and DVFS [18]. The methodology the proposed comprised of receiving the load by host which is energy efficient given by MIPS ratio as energy consumed by host. The algorithm proposed by them is capable of improving power consumption in clouds containing heterogeneous datacenters. The

algorithm presented by them is capable of task scheduling in non -federated datacenters, homogeneous and heterogeneous, with different workload size. The algorithm results showed that its performance was better for heterogeneous and large datacenters. They proposed future work strategy to improve algorithm's efficiency by measuring size of virtual loads to be processed, modeled as studies in bin-packing problem by applying heuristics [18].

2011-Q. Huang et.al. gave the idea to power consumption evaluation. They analyzed that virtualization technology or virtual machine migration apart from bringing resources distribution benefits also increased the power consumption [19]. They stated that employing the consolidation strategy, power overhead is less as compared to regular deployment. Their paper presented cost of live migration for physical layers at source and destination in accordance to CPU utilization. Their results generated the facts that the power impact of live migration falls on increase of CPU utilization whereas the destination server is not influenced by CPU usage of virtual server transferred. Their result showed that time cost for source and destination is not effected by CPU usage of virtual server. They gave their future methodology over power consumption in live migration and determining migration cost [19].

2010-A. Beloglazov et. al. remarked that computational power demand by various applications has created large scale data centers consuming power rapidly [20]. They proposed energy efficient resource management system by continuous consolidation of VM's. The consolidation in accordance with virtual network topologies, resource utilization, computing nodes thermal condition. They proposed simulation driven evaluation of heuristics. They gave the methodology of live migration of VM's reallocation according to CPU performance. They presented the de –centralized architecture of energy efficient and aware resource management system. They evaluated the heuristics by simulation using cloudsim toolkit. They set utilization thresholds for flexible adjustment of SLA by MM policy. The policy suggested by them supported heterogeneity of hardware and VM and is independent of type of workload. The results they obtained showed the energy savings by dynamic consolidation of VM [20].

2010- J. Baliga et. al. proposed that network based cloud computing is continously increasing with increase in power consumption.they focussed on energy consuption due to transmission ,switching networks, data processing and data storage because energy used in these processes is significant percentage of whole energy used by cloud.they remarked that cloud computing save energy when tasks are infrequent and also in some situations cloud computing can use more power than conentional computing.They evaluated the energy consumption on storage , software and processing and stated that due to increase in energy consumption in transport public cloud storage uses more energy than private cloud storage still when files are in continous access cloud storage service is efficient compared to hard disks .however they analzed increase in energy consumption when file download frequency increases in cloud storage [21].

2009- R. Bolla et. al. proposed the need of energy efficient network technologies .they proposed feasible power management policies suited to heterogeneous set of modular architectures used for developing network equipment's. The proposed policies aimed at optimizing the power consumption of each device with respect to its network performance. They applied these policies to SW router platform for evaluating the results. The proposed approach suited with different equipment architectures. The results obtained with COTS SW router provided power saving of 30% in idle states only [22].

III. PROPOSED WORK

MAX-MIN algorithm

Pseudo code for the Negamax version of the minimax algorithm (using an evaluation heuristic to terminate at a given depth) is given below.

The code is based on the observation that $\max(a, b) = -\min(-a, -b)$. This avoids the need for the algorithm to treat the two players separately but cannot be used for games where a player may have two turns in succession.

```
1. function integer minimax (node,depth)
2. if node is a terminal node or depth <= 0:
3. return the heuristic value of node
4. α = -∞
5. for child in node:                    # evaluation is
   identical for both players
6. α = max(α, -minimax (child, depth-1))
7. return α
```

Fuzzy Rule based System

1. For each particle database.
2. Initialize particle
3. End For
4. Do
5. For each particle
6. Calculate fitness value of the particle fp
7. /*updating particle's best fitness value so far)*/
8. If fp is better than pBest
9. set current value as the new pBest
10. End For

11. /*updating population‘s best fitness value so far)*/
12. Set gBest to the best fitness value of all particles
13. For each particle
14. Calculate particle velocity according equation (1)
15. Update particle position according equation (2)
16. End For
17. While maximum iterations OR minimum error criteria
18. is not attained

```
1.  G := set of pages
2.  for each page p in G do
3.  p.auth = 1 // p.auth is the authority score of the page p
4.  p.hub = 1 // p.hub is the hub score of the page p
5.  function HubsAndAuthorities(G)
6.  for step from 1 to k do // run the algorithm for k steps
7.  for each page p in G do  // update all authority values first
8.  p.auth = 0
9.  for each page q in p.incomingNeighbors do // p.incomingNeighbors is the set of pages that link to p
10. p.auth += q.hub
11. for each page p in G do  // then update all hub
```

IV. CONCLUSION

The various techniques implemented for the energy consumption in cloud computing are efficient but the survey done on the advantages and limitations of these techniques proved that there is some enhancement in the technique to make them more accurate and simple to implement.

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