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RESEARCH ARTICLE

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ANALYSIS OF ENERGY CONSUMPTION IN GREEN CLOUD COMPUTING

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ABSTRACT
Cloud computing uses the service demands for their consumers. The energy used to the framework can move the virtual machines to individual machines. The data center needs large electricity. The researchers to put their new ideas to reduce the energy .it are very difficult to give VM resource allocation to minimum violation is SLA in given time. Here energy minimize with hybrid algorithms using response time and throughput. In this paper large scale algorithms using three parameters, energy consumption, SLA violation and throughput. The result to obtain less energy usage and SLA violation with large amount of throughput than the Migration algorithms
Keywords— Green Cloud Computing, Energy consumption, Service level agreement

INTRODUCTION

In the recent trends the cloud computing is enormous amount of growth in IT industry. it prodce a large number of computing and its related fields and its resources to satisfy customer needs. it occupies and uses a large amount of electrical energy at the data center, at the end it emits of CO_2 high as 2% through IT industry, the main issues grown rapidly ,we need efficient energy resource management. In this issue we reduce to wastages of power usage or consumption by computing nodes. The usage of N number of nodes and large applications in green cloud environment at data center to create on demand dynamic resource allocation, to develop computer needs in day to day activities high to usage of power consumption

The energy efficiently using green cloud computing for researchers has made various problem solving methods for finding the cloud efficient with the help of power and energy performance, most of the cloud computing components have nor to use the network process because the size is large to process the network energy consumption. the green cloud computing can use to run the program applications on cloud ,here we used VM to reduce the number of effective and active server used in the excessive load for some servers ,here the heat emission for distribution of load in the servers. once the load is overload the server itself redistribute by the neighbor loads, then the load are equally shared for all the servers uniformally,so we provide a unified problem solving method using to enable green

cloud computing, we propose green cloud computing to reduce the energy consumption with help of cloud.

Global warming is the important and high power consumption and CO_2 emission. Nowadays the Greenpeace, Environmental Protection Agency of USA and climate savers and eco-friendly forced the researchers to use green cloud computing

EASE OF USE

GREEN CLOUD COMPUTING FRAMEWORK

It is a simple way to reduce the number of physical machines in computational task and improve energy efficiency. In Green cloud computing reduces the number of servers for using several task used earlier. the green system architecture used for energy consumption. Fig shows Green Cloud computing architecture

Application Layer

First layer that works at the customer needs for business process Resource management Second layer it works the customer need and dealing with the customer demands and estimating energy estimation and various resources and Virtual machines and SLA analyzer the energy can be controlled and efficiently used in the following factors

Applications

In recent years the software developers has remarkable changed its state to distribute their applications and used. New technology dramatically changed their environment to software as a service the process time can be reduced and and cost to minimize to usage of cloud computing ,the application layer itself used a new applications are upgraded and new technologies can be implemented for the latest tools can be used for low energy consumption and time taken for the process is low and CO_2 emission is low

VIRTUALIZATION AND PROVISIONING:

Most of the cloud networks are used internet as a service, wherever there is a need in the data it can be virtualizes and providing the data can be distribute with the help of virtualization. Once the researchers starts focusing on minimizing the datas in securing the scheduling algorithms. The VM are used to change and scheduling and heat emission of process and temperature can be maintained and redistribute the load are done in vitalization and provisioning

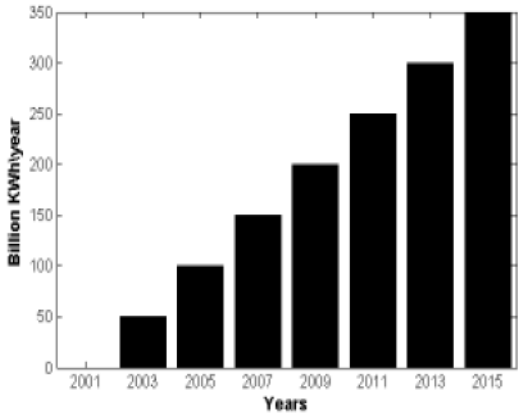
COOLING, NETWORK, AND STORAGE

The new technologies can be updated the researchers and developers in the current IT industry, they can be switch over to green cloud computing and it has a efficient data center and it can buit the energy upto its control to improve the energy efficient in each and every individual systems in green cloud environment

MONITORING/METERING

We can be predict the measurement of energy efficiency to know the individual system to emits how much energy consumed and how much amount of co2 can evaporated,that and all we can calculate the performance of a individual systems and power usage effectiveness

PUE = Total Facility Power/IT Equipment Power

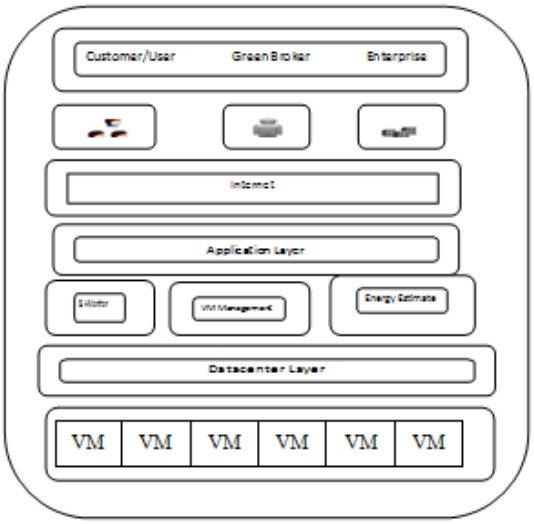


Level of Energy Consumption

Data center layer

It is the combination of both physical and logical or virtual machines ,we received a large number of request from the user side for resources ,it is very difficult to give resource requests, so we need to create imaginary unit for connecting the request accepted.

There are N number of data centers to solve the customer queries and these data centers need high amount of power on the other side the power.Day by day the power consumption is slightly increasing,so green cloud computing to reduce the power issues

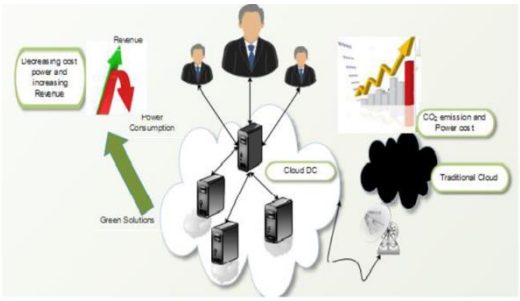


Existing Work

Recent trends a large researches are made to improve the application of green computing in day to day life with different parameters, the energy used in the data center is high.Here PUE measured how a datacenter uses its power.the range ofPUE varies from origin to infinity. If the value of PUE 1.0 efficiency 100% used by IT industry

Truong Duy, Sato and Inoguchi *et al.*, [3]implement the green scheduling algorithms combines with neural network predictor for reducing the energy consumption in cloud computing,in this algorithm,the server can dicides the load from time to time ,it calculate in peak load number of server state todicide. Let, No is the number of server in ON state and Nn is the number of necessary servers. If the Nn > No then, choose server in OFF state, signal them to restart and if Nn < No choose server in ON state and signal them to shut down

Fumiko Satoh *et al.*, [4] also focus on reducing the usage of energy in data centers. But for the future energy management they develop an energy management System for cloud by the use of sensor management function with an optimized VM allocation tool. This system will help to reduce the energy consumption in multiple data centers and results shows that it will save 30% of energy



a. MAINTAINING THE INTEGRITY OF THE SPECIFICATIONS

Cooling is other major issue that consumes huge amount of energy in data centers. Previously, the cooling is done by using mechanical refrigerator that supply chilled water for the IT equipments. Now a day's pre cooling also called as free cooling is used. Free cooling minimizes the use of mechanical cooling. Like Face book deploys their data centre in Sweden which has cold and dry climate. Microsoft leaves servers in open air in order to cool the servers easily. Also Google uses river water to cool their data centre [1]. There are different hardware technologies like virtualization and software technologies like software efficient algorithm used to decrease the consumption of energy.

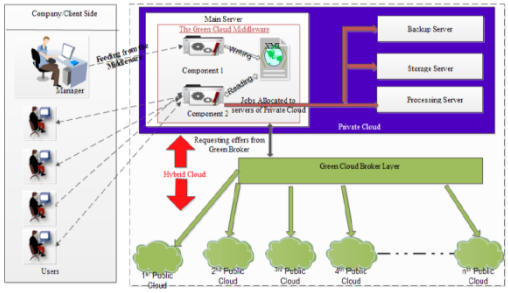
Hosman and Baikie *et al.*, [14] gave a new challenge in the field of cloud computing, datacenters consumes a lot of energy and energy is available every time is not necessary, so the author is discussing in his paper about the solar energy. How the solar energy can play a vital role in data centers energy consumption is the hot topic of discussion. In this paper author proposed a small level cloud data center which is the combination of three technologies are "less power consumption platform, energy efficient cloud computing and DC power distribution".

EXISTING APPROACHES

Buyya *et al.*, [24] Contributes carbon green cloud architecture which points on the third party concept, consist of two types of directories named as green offer and carbon emission. These directories help us to provide and utilize the Green services from users and providers both.

The services of the providers are registered in the "Green offer Directory". The Green Broker accessed these services and

organized it according to the price, time and the service that offer least CO2 emission. The Carbon Emission Directory keeps and stores the data which contains the information of energy and cooling efficiency of cloud services and data centers. The green broker used the up to date information about services.



Integrated green Cloud architecture

There are two type of architecture, one is client side and another one is server side, in client side both the client (user) and Client managers are available. it processed the execution destination work for the server side including middleware cloud, there are different servers are available like green broker and middle server, sub server and where the data can stored in data storage server. The directory concept is used the green broker layer to fulfills all the information of cloud and given better green service provide to the user, when the server manager get the request information from the client side ,the request is sub divided and the jobs are equally distributed to the nearby users ,the amount of carbon emission and how much energy is used for the given job to be executed by the private cloud, the best green is selected and offering by the server security managers to do the adequate security measures to made by the job, when the green offer to selected by the server manager then the required information is stored by the XML for further usage

If the required given job not available the job is executed by cloud server or local server, there are three places the user job can be executed first local on the client requester side ,then the middleware where the requested data stored in the database, so next time the data can fetched easily, when the middle ware know all the information about these three places, if the job is executed in private cloud where the cloud data is stored in the file system as well as the name of the server is used

Whenever the user request for the services, it contacts with the Green Broker. The Green Broker uses these directories and chooses the green offer and energy efficiency information and allocates the services to the private cloud. And finally give the result to the users

ADVANTAGES AND DISADVANTAGES

We have mentioned both positive and negative points to be made for the existing data's some of the architecture of green cloud computing need the co2 emission to measure to the best result and gives a less number of carbon emission, if the carbon emits is less the energy usage level also decrease both are directly proportional to one another similarly the carbon emission and energy is not under control ,the quality of service and security given by the server ,the main disadvantage form the green cloud computing when the central manager of the server is collapse or crash or failure the entire sub systems also failure

CONCLUSIONS AND FUTURE WORK

The cloud computing is used the contribution and potential for controlling carbon emission, with the series of continuous research the cloud computing can become green, because the data center carbon emission for the near features became triple or four times high, it is very dangerous for the environment and it is very difficult to survive in the earth to breath freely, the latest survey said there are more than 8.0 billion tons of co2 emitted per year, so the IT analyst and researchers have planned to switch over to green cloud computing why because the data centers are used in cloud, the energy emission and cost effective are used in green cloud, if we calculate how much load we give and how many servers can be deployed with help of automatic process, so the co2 emission and energy emission is under control. the co2 emission is under control with the help of reduced and redistribute the load from the respective servers

Our current technology can be changed to new environment first the operating system can be updated and the latest to tools can be used to

process the database, so the procss time can be reduced and time can be saved

In each and every servers in the data centers can be upgraded with latest cooling systems, so the cooling systems are used the power consumption and cooling requirement and various hardware resources are used archive high efficiency. All the factors can be considered including power usage,co2 emission, memory and cpu can be considered to reduce the power consumption and reduce the heat emission with help of cooling systems

CONCLUSIONS

We identified the problems of cloud and the next generation use of green cloud computing and we used the recent problem identified in the field of green computing for healthy and green environment .Whenever the user request for the services, it contacts with the Green Broker. The Green Broker uses these directories and chooses the green offer and energy efficiency information and allocates the services to the private cloud. And finally give the result to the users approach to automate manager of green cloud who makes all the services

Each client can perform to all the work in a single system with energy saving techniques which can be utilized the virtualization and the high advanced cooling systems ,then the cloud computing always used as a green cloud environment and greenest cloud computing technology in near feature

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