FINAL YEAR TECHNICAL SEMINAR REPORT

GREEN CLOUD COMPUTING

Submitted in partial fulfilment of the degree of Bachelor of Technology
Rajasthan Technical University

By

Ishan Jain
(PGI18CS019)

DEPARTMENT OF COMPUTER ENGINEERING
POORNIMA GROUP OF INSTITUTIONS,
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CERTIFICATE

This is to certify that Final Year Practical Training Seminar Report entitled "**GREEN CLOUD COMPUTING"** has been submitted by "Ishan Jain (PGI18CS019)" for partial fulfilment of the Degree of Bachelor of Technology of Rajasthan Technical University. It is found satisfactory and approved for submission.

Date:18/12/2021

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DECLARATION

I hereby declare that the seminar report entitled "**GREEN CLOUD COMPUTING**" was carried out and written by me under the guidance of Ms. Shefali Parihar, Assistant Professor, Department of Computer Engineering, Poornima Institute of Engineering & Technology, Jaipur. This work has not been previously formed the basis for the award of any degree or diploma or certificate nor has been submitted elsewhere for the award of any degree or diploma.

Place: Jaipur

Date: 19/09/2021

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ACKNOWLEDGEMENT

A project of such a vast coverage cannot be realized without help from numerous sources and people in the organization. I am thankful to **Mr. Shashikant Singhi, Chairman, PGC** and **Dr. Dinesh Goyal, Director, PIET** for providing me a platform to carry out such a training successfully.

I am also very grateful to **Mr. Deepak Moud (HOD, CE)** for his kind support.

I would like to take this opportunity to show my gratitude towards **Dr. Megha Gupta (Coordinator, TS)** who helped me in successful completion of my Final Year Technical Seminar. They have guided, motivated & were source of inspiration for me to carry out the necessary proceedings for the training to be completed successfully.

I am also grateful to my guide for help and support.

I am thankful to **Ms. Shefali Parihar** for his kind support and providing me expertise of the domain to develop the project.

I am also privileged to have **Mr. Chandan Kumar Dubey and Ms. Pooja Sharma** who have flourished me with their valuable facilities without which this work cannot be completed.

I would also like to express my hearts felt appreciation to all of my friends whose direct or indirect suggestions help me to develop this project [and to entire team members for their valuable suggestions.

Lastly, thanks to all faculty members of Computer Engineering department for their moral support and guidance.

Submitted by:
Ishan Jain

ABSTRACT

As the demand for cloud infrastructure grows, so does energy consumption. The greed for power has resulted in a significant increase in the environment's carbon emissions. The ever-increasing demand for energy is primarily due to the growth of data centres with multiple servers as well as other infrastructural facilities. As a result of the increased use and adoption of Cloud Computing, green energy practices have become a concern.

Hence, green cloud computing focuses on the research and development of energy-efficient methods that are less harmful to the environment. As a result, there is a need to investigate various techniques for reducing cloud energy consumption, as well as the development of an algorithm to reduce it. This paper is to investigate cloud-based energy-saving approaches and discuss about advantages and disadvantages of Green Cloud Computing.

Subject Descriptors:

6CS4-06 Cloud Computing

Keywords:

energy consumption, increasing, energy, environment, techniques cloud, energy efficient.

Software and Hardware:

Lenovo personal laptop

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CHAPTER-1

INTRODUCTION

1.1 Introduction to Area of Research:

For a variety of reasons, cloud computing has become a critical infrastructural requirement for an organization. However, rising demand had also contributed to increased power usage, which has increased the carbon output of the environment. Large number of servers and other components will be required because more data centres are introduced to an organisational realms to empower complete operation. Because it causes severe environmental damage, the concept of green cloud computing appears appropriate for such modern and future scenarios.
The cloud is much more than a term for the Web; while the Internet is indeed a foundation for the cloud, it is also more than that. Cloud services are available as public or private resources, each of which serves different needs:

- Public cloud
- Private cloud
- Hybrid cloud

Cloud computing provides organisations with setup, phase, and coding that are available to customers as membership-based administrations.

Infrastructure as a Service (laaS), Platform as a Service (PaaS), and Software as a Service (SaaS) are terms used in the industry to describe such administrations.
Cloud computing is the delivery of shared assets, programming, and data to PCs as well as other devices on a pay-as-you-go basis rather than as a system.

The several cloud providers, including Google, Yahoo, and IBM, are speedily launching data centres across the globe. These data centres are also not expensive, and they're also environmentally damaging. The green computing idea, that further manages data centre resources in an energy-efficient manner, is introduced to tackle this issue.
As a result, Green cloud computing services help you save money on both energy and operations.

Applications:

In cloud computing, sharing and managing resources is simple. That is why it is one of the most important computing fields. Because of these characteristics, it has become a key player in a variety of fields. Now, let's look at some real-world cloud computing applications.

1. **Backup & Recovery:**
   Cloud vendors provide security by storing data in a secure location and providing a

backup service for the data. They provide a number of data recovery applications to help you recover your lost files. Backup of data is a complex problem in the traditional sense, and recovering lost data is extremely difficult, if not impossible. However, cloud computing has simplified backup and recovery applications, eliminating the risk of running out of backup media or losing data.

2. **Data Storage:**
   Data Storage applications of the computer are also one of the options for Applications of Cloud Computing. It is also one of the various cloud applications, which allows you to store information such as data, files, images, etc, on the cloud. It helps access the information using the cloud application. These Applications of Cloud Computing are created for security and ensuring data is backed up securely. Data can be restored and converted into various file formats which include word, pdf, excel, and so on. Applications such as Box, mozy, jouks and Google Suite are perfect cloud storage examples.

3. **Anti-virus Applications:**
   Support is also available for a variety of antivirus applications. These cloud application services ensure that the system runs smoothly. They help users in a variety of ways, including cleaning the system, detecting and fixing malware and other types of viruses. This antivirus is completely free and is widely regarded as the best antivirus for personal computers. The main purpose of this application is to detect malware and fix it by sending the information to a cloud data centre. Some of the most widely used cloud antivirus software includes Sophos Endpoint Protection and Kaspersky Endpoint Security Cloud.

4. **Entertainment:**
   There are also entertainment apps that interact with a specific audience using a multi-cloud strategy. Online gaming and entertainment services are provided by Cloud Computing Applications. Many online games are designed to provide a quick and seamless connection. Cloud computing was used to create two entertainment applications: Project Atlas and Google Stadia.

5. **Cloud-computing in Education:**
   By providing e-learning, online distance learning platforms, and student information portals to students, cloud computing in the education sector brings an incredible change in learning. It is a new educational trend that offers students, faculty members, and researchers an appealing environment for learning, teaching, experimenting, and other activities. Everyone in the field has access to their organization's cloud and can access data and information from there.

6. **Medical Fields:**
   In the medical field also nowadays cloud computing is used for storing and accessing the data as it allows to store data and access it through the internet without worrying about any physical setup. It facilitates easier access and distribution of information among the various medical professional and the individual patients. Similarly, with help of cloud computing offsite buildings and treatment facilities like labs, doctors making emergency house calls and ambulances information, etc can be easily accessed and

updated remotely instead of having to wait until they can access a hospital computer.

7. **Testing and Development:**
   A number of different of IT facilities and capital are required to set up a programming model and then carry out various testing methods to make sure that the product is available for launch. Although if implementation is done using their IT resources at a minimal price, cloud computing provides the simplest way for development and testing. It provides flexible and efficient cloud services for product innovation, testing, and deployment, which is more beneficial to businesses.

8. **Social Media:**
   Applications like Facebook, Twitter, Yammer, Linkedin, and others help users connect in real time. These apps allow you to share videos, images, experiences, and stories, among other things.

9. **Management Application:**
   Various online applications let a lot of users to interact with each other every minute. Applications like Facebook, Twitter, Yammer, Linkedin, and others help users connect in real-time. These apps allow users to share videos, images, experiences, and stories, among other things.

10. **Bigdata Analysis:**
    We understand that size of data is so huge that storing it in a traditional data management system for an organisation is impossible. Cloud computing, on the other hand, has solved this problem by letting customers to hold lots of data without having to worry about real data storage. The next step is to examine the fresh data and extract useful information or ideas from it, which is a difficult task that necessitates the use of high-quality data analytics tools. In terms of storing and analysing big data, cloud computing offers the most flexibility to businesses.

1.2 Introduction to the Topic:

The term 'Green Cloud Computing,' which combines the terms green and cloud computing, means that it is eco-friendly. The objective is to lower energy usage and also waste sent off to landfills.
Green technology that allows users to benefit from cloud storage while lowering its adverse environmental impacts, which has an impact on human health. It consists of the following practises:

Green design: Energy-efficient facilities, computer systems, software products, as well as other devices are included in the cloud infrastructure design, which are using less energy than their competition.

Green usage: When using a cloud-based service, it reduces the energy generated by 27%.
Green computing refers to the need for PCs and associated resources such as physical hosts, virtual machines, and CPUs in an eco-friendly manner.

Green computing can be confronted in a variety of ways, including:

- Dynamic Voltage and Frequency Scaling (DVFS)
- Nano Data centres
- Virtualization
- Energy Efficient Hybrid Policy
- Utilization Prediction Aware VM Consolidation
- Anti-Correlated VM Placement

Data is stored in data centres, just like in cloud computing. Data centres use more energy, resulting in higher CO2 emissions. As an outcome, data centres that use a lot of energy have emerged of the development of cloud computing. Global warming has recently become a major concern due to high energy usage and CO2 emissions. Green cloud computing, which provides methods and calculations to reduce the power consumption, has grown in importance as energy has become a major concern in general.

1.3 History:

IT's widespread adoption has resulted in unintended consequences such as increased energy consumption and pollution. The amount of energy used by technology is rapidly increasing.

"The IT industry consumed approximately 61 billion kilowatt-hours of electricity in 2006," according to a recent US Environmental Protection Agency (EPA) report. This amounts to 1.5 percent of all electricity used in the United States. The power bill is estimated to be around $4.5 billion. The US Federal Government's servers and data centres account for about 10% of total consumption, or 6 billion kWh" ("Green computing and D-Link," 2009).

As a result of this awareness, a process known as "the greening of IT" has emerged. In 1992, the Energy Star program, which labelled electric items like refrigerators and air conditioners that used less energy and were more efficient, gave birth to the concept of green computing. In October 2006, it was updated to include more stringent computer equipment efficiency requirements ("ENERGY STAR Program requirements for computers," 2006).

The Kyoto Protocol, established by the United Nations in 1997, required manufacturers to measure the cost of electricity used by computers and enforced the decreased carbon emissions. In 2003, the European Union passed the Restriction of Hazardous Substances (RoHS) directive, which made it illegal for using certain hazardous elements in the manufacture of electronic equipment. Public Law 109-431 was passed in 2006 by the United States to study and promote the use of energy-efficient computer servers.

Following that, in 2007, President George W. Bush issued Executive Order 13423, which mandated that all US national authorities purchase computer systems using the Electronic Products Environmental Assessment Tool (EPEAT), a set of criteria order to improve the efficiency and longevity of electronic products (Bush, 2007).

CHAPTER-2

TECHNOLOGY SPECIFICATION

2.1 Technology Used:

Green Cloud Computing is a win-win situation for both the provider of cloud services and the environment. Green cloud is not only good for the environment, but it also helps service providers make more money by maximising resource utilisation. We can make existing cloud environments green certified by enforcing certain management policies and characteristics. Green cloud features include energy efficiency, virtualization, multi-tenancy, consolidation, recycling, and environmental friendliness.

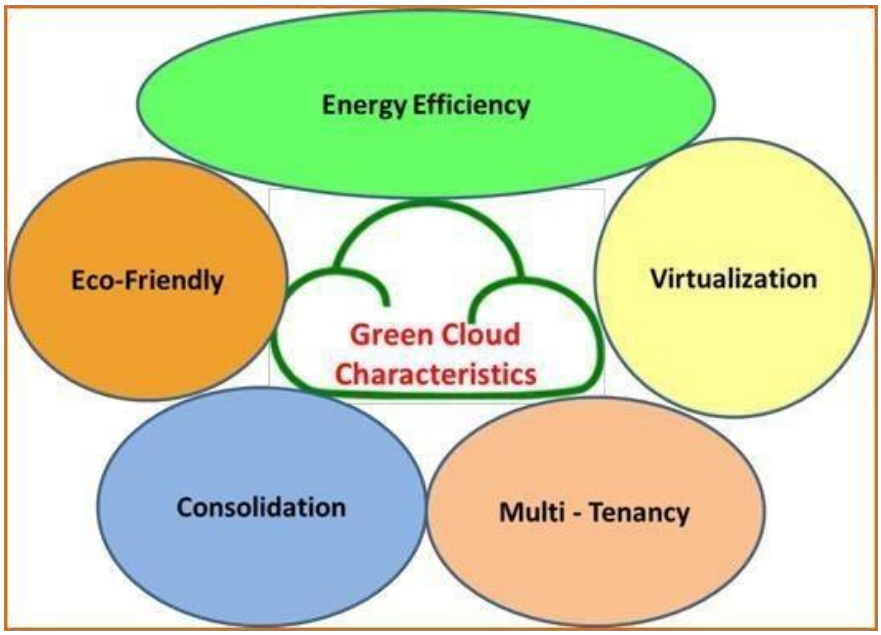

Fig 1- Essential Characteristics of Green Cloud Computing

2.2 Literature Review:

We thoroughly verified many journals, conferences, white papers, and web sources as part of our research analysis on "Green Cloud Computing" to get the most up-to-date information on green cloud computing and its characteristics. We present a literature review on green cloud computing in this section, along with relevant previous research publications. Each notable research activity in the field of green cloud computing is briefly discussed, along with author information.

Q. Chen, P. Grosso, K. v. d. Veldt, C. d. Laat, R. Hofman and H. Bal, "Profiling Energy Consumption of VMs for Green Cloud Computing", they presents their preliminary findings from profiling virtual machines in relation to three energy measurements: energy, power efficiency, and power, across a range of high computing workflows. They developed a linear model that depicts the behaviour of a particular work device and accounts for the quality of different elements like the Central processing unit, memory, and hard disk drive to the power consumed of a specific work device. Their findings may be used to create a power categorization subsystem for cluster measurement techniques; a future Green Clouds energy-aware scheduling algorithm may use this monitoring system that supports optimal design.

F. Farahnakian, T. Pahikkala, P. Liljeberg, J. Plosila and H. Tenhunen, "Utilization Prediction Aware VM Consolidation Approach for Green Cloud Computing", they test the impact of VM and host recourses usage projections in the VM consolidation task using real workload traces. Their methodology surpasses other optimization algorithm in decreasing energy usage, the number of VM placement, and the amount of SLA violations, according to the results of their experiments.

M. N. Hulkury and M. R. Doomun, "Integrated Green Cloud Computing Architecture," A client-oriented Green Cloud Middleware is introduced as part of an Integrated Green Cloud Cloud Architecture (IGCA) to assist the management in better supervising and customising their total access to digital services in the best or most energy-efficient ways. The middleware uses predefined software requirements such as service level agreements (SLAs), quality of service (QoS), design standards, and job roles given by the IT department to smartly manage the action of whether to use local machine handling, private clouds or public clouds. The feasibility of ensuring optimal energy usage while choosing between local, private, and public cloud service providers is illustrated using an analytical model.

M R. Shaw, E. Howley and E. Barrett, "A Predictive Anti-Correlated Virtual Machine Placement Algorithm for Green Cloud Computing,", Due to the evolving nature of cloud services, one of the biggest challenges for VM placement methodologies is precisely forecasting future resource requirements.
Moreover, regardless of the fact that they may have the capacity to boost selections, placement strategies on co-located resource utilization are rarely considered. This paper evaluates the most broadly utilised predictive model and presents a predictive anti-correlated VM placement strategy using real workload indications. Our evidence based experiments demonstrated that the proposed approach saves 18 percent more energy than some of the most commonly used placement policies while also lowering service breaches by over 47 percent.

CHAPTER-3

TOPIC DESCRIPTION & WORK PERFORMED

3.1 Topic Description:

Green Cloud Computing is a computing model that is environmentally friendly, energy efficient, converged, virtualized, and so forth. It benefits not only the environment, but also the cloud data centre and cloud service provider by maximising resource utilisation.

Biodiversity and climate change are the primary drivers of the need for green computing. According to Greenpeace, the global atmosphere is rapidly shifting, resulting in a variety of environmental issues such as rising water levels, increased storm frequency, and melting Antarctic and Arctic ice.

Greenpeace is a non-governmental organisation that promotes long-term environmental conservation and sustainability. According to Greenpeace, one of the major contributors to climate change is the use of oil/fuel and gas that results in atmospheric pollution such as carbon dioxide (CO2).

Cloud service systems will account for about 94 percent of computation by 2021, according to Cisco. Furthermore, according to the International Data Corporation (IDC), by 2025, the amount of data produced and used will have increased to 175 zetta bytes. This necessitates cloud providers setting up new data centres and services.

More enterprise storage centres and networks are provisioned in the cloud as a result of the types of facilities and appliances. As a result, there is a rise in electrical demand. Customers can use VMs (Virtual Machines) that are built and run in data centres to access cloud storage services. The data centres are made up of a number of physical servers, each of which has its own set of services. As a result, every cloud contains a massive amount of materials that consume a lot of electricity and emit a lot of CO2.

3.2 NEED OF GREEN CLOUD COMPUTING

- Cloud computing makes use of a data centre to provide all of the facilities. Data centre accommodations are energy drainers, accounting for between 1.1 percent and 1.5 percent of global energy consumption in 2010.
- According to the US Department of Energy, data centre accommodations use 100 to 200 times the energy than basic office spaces. From the IT hardware to the HVAC (heating, ventilation, and air conditioning) devices to the exact place, arrangement, and design of the facility, an efficiency of data strategy .

- The US Department of Energy has identified five primary areas where efficient dynamic centre design standard procedures should be focused: Environmental conditions, air management, cooling systems, and electrical systems are all examples of information technology (IT) systems. The United States has specified supplemental energy-efficient potential avenues.

- Department of Energy include on-site electrical generation and recycling of waste heat. Energy efficient data centre Cloud Consumers Web Browser, Mobile App, Thin Client design should help to better utilize a data centre's space, and increase performance and efficiency.

- The proportion of computer resources needed for any given computing feature is impacted by algorithm reliability, and there are several performance trade-offs when writing apps. Switching from a gradual (e.g. linear) search method to a quick (e.g. hashed or indexed) search method can decrease usage of resources for a given task from significant to near-zero.
- According to a Harvard physicist's study from 2009, the average Google search emits 7 grams of carbon dioxide (CO2). Google, on the other hand, refuted this figure, claiming that a typical search produced only 0.2 grammes of CO2.
- A data centre that is eco-friendly The Web Browser, Mobile App, and Thin Client design features for Cloud Users should help to better utilise a data centre's area, as well as enhance productivity and effectiveness.

- The efficiency of algorithms affects the amount of computer resources required for any given computing function and there are many efficiency trade-offs in writing programs. Algorithm changes, such as switching from a slow (e.g. linear) search algorithm to a fast (e.g. hashed or indexed) search algorithm can reduce resource usage for a given task from substantial too close to zero.

- In 2009, a study by a physicist at Harvard estimated that the average Google search released 7 grams of carbon dioxide (CO2). However, Google disputed this figure, arguing instead that a typical search produced only 0.2 grams of CO2.

3.2 PROPOSED APPROACH

Green computing can be accomplished in four steps: hardware device manufacturing, software techniques, public awareness, and standard policies.

The following are some useful green cloud computing techniques:

Virtualisation:

Using the abstraction process, the virtualization concept is designed to run several logical (virtual) computers on a single physical computer (hardware device). Hypervisor is system software that acts as an operating system (abstraction layer) for virtual machines, coordinating with the underlying hardware components based on the virtual machine's instructions. Virtualization is not a new concept in IT; it was first implemented on our venerable Mainframes, which are second-generation computing devices.

Cloud systems are typically built with high-end configuration components such as RAM, Processors, Disks, Routers, and Switches. Before the running task(s) begin, traditional (sequential) processing methods will allocate the entire resource set to them.

A task's allocated resources cannot be swapped with those of other running tasks. As a result, the allocated resources are underutilised, some tasks are blocked, and the execution takes longer to complete. Hypervisor-based VMs are later designed to run multiple jobs in parallel on the same machine with resource sharing facilities to overcome sequential processing limitations.
Farzad Sabahi's research paper on cloud virtualization looked at three methods for creating virtual machines: operating system-based virtualization, application-based virtualization, and hypervisor-based virtualization (Farzad Sabahi, 2012). He spoke about the privacy and security of virtual machines, as well as the design of virtual machine activity monitoring systems (VSEM, VREM).

Extracting Virtualization's main benefits include increased resource performance, fewer infrastructure investments, and more efficient resource utilisation. Virtualization's accomplishments include high-speed processing, low power consumption, high-end resource utilisation, and cost savings, all of which aid in the design of green clouds. Green cloud activities include dynamic work load balancing with VMs, resource sharing across VMs, secure VM design, and energy optimization techniques for virtualization.

Dynamic Voltage and Frequency Scaling (DVFS):

DVFS allows energy usage to be reduced while efficiency is increased. The whole strategy uses an electronic clock whose frequency band is synched with the power supply, and it save the very little power when compared to other techniques. To save power, DVFS allows processors to run at various combinations of frequencies and voltage.

Nano Data Centres:

A nano data centre is a cloud based platform that uses significantly less energy than traditional data centres. It is built on the idea of having a bunch of smaller data centres scattered topographically and linked, instead of the traditional data centres, which are bigger in scale and lesser in number and utilise up to 30% more energy.

Anti-Correlated VM Placement:

Consider the relationship between migrating VMs as an important factor in optimising resource utilisation. It is widely accepted that VM workloads have dynamically changing resource requirements over time as the number of user requests changes. This gives us two different aspects of the placement problem to think about. To begin, resource utilisation can potentially be improved by grouping highly complementary VMs based on their aggregated CPU requirements, as CPU is one of the most dominant factors in energy.

However, the demand for each VM is anti-correlated, with great moments of usage differently at various times, and the direct means of usage for both workflows is different, at 30-60% and 10-20%, respectively. Separating these VMs requires a distribution of 80 percent abilities across the two servers in this case.

By grouping two VMs on a single host based on their aggregated resource demand, it is essential to distribute fewer resources to satisfy the same workflow. This results in a 10% reduction in capacity due to this placement decision alone. Additionally, locating multiple VMs on some kind of server that is considered being the best option for placement seems to have the capacity to lower resource dislocation across the data centre.

By exploring the implications variations from the VMs ready to be redistributed, we can make better decisions to optimise the use of restricted resources. This can improve data centre efficiency by better utilising their overall capacity. The second component of the placement challenge, which is also becoming a greater concern for cloud services, is the ability to successfully estimate resource utilization due to the rapidly changing of workloads. A more effective VM placement tactic must be able to determine market expectations in order to support and prevent redundant placement decisions.

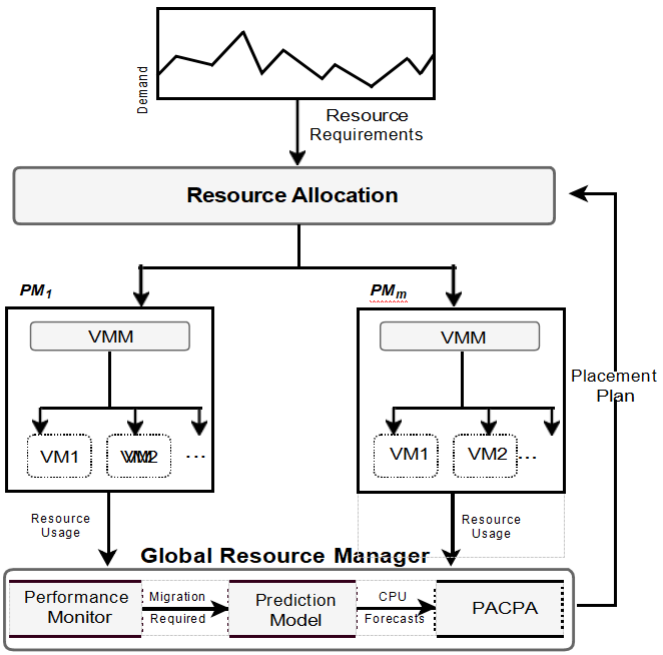

Fig 2: System Architecture

Energy Efficient Hybrid Policy:

To decrease energy usage in the cloud data centre, we can use kinds of strategies. The suggested scheme identifies a wiser option setup for the virtual machine to be migrated, as well as an ability to determine which server will be selected for virtual machine redeployment. Which virtual machine is chosen for relocation and which host is selected to shift that virtual machine will be decided by the hybrid VM selection strategy and low usage host selection strategy.

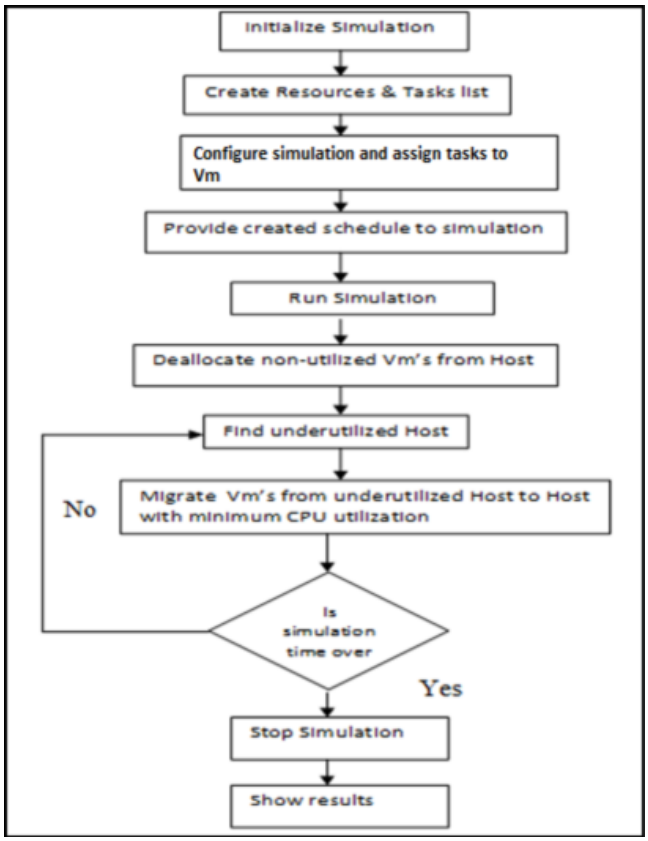

Fig 3: Flow chart of Energy Efficient Hybrid Approach

Utilization Prediction Aware VM Consolidation Approach:

Utilization Prediction-aware Best Fit Decreasing (UP-BFD) is a dynamic VM consolidation approach that optimises placement of virtual machines (VMs) based on present and projected resource requirements.

By issuing cold spots, the UP-BFD algorithm shifts VMs from least-loaded hosts (cold spots) to most-loaded hosts (hot spots), lowering data centre energy usage. None are shifted if all

VMs in the coldest spot are incapable to shift to other hosts. As an outcome, VM relocations that do not result in the release of a cold spot will be skipped, letting us to remove VM relocations that aren't required. Because allocating a VM to a host demands that same proportion of host resources, a good VM consolidation methodology should take this into consideration. It means that when deciding on VM placement, the ratio of resource usage in every host should be taken into account.

Which VMs should be migrated from one host to another is decided by the UP-BFD algorithm. Its primary objective is to shift a heavily loaded VM among all the VMs on a host. The fact that larger VMs are more difficult to integrate into other hosts. Lv, the load of the VM v, is defined as

Lv = RCPU(v) + RMEM (v)
RCPU(v) = UCPU(v) CCPU(v)
RMEM(v) = UMEM(v) CMEM(v),

RCPU(v) and RMEM(v) are the CPU and memory utilisation of the VM v, respectively. The VM v's demanded CPU and memory utilisation is represented by UCPU(v) and UMEM(v), while the VM's total CPU and memory usage is represented by CCPU(v) and CMEM(v).

3.3 Result

We have discussed about various approaches for achieving green cloud computing like a dynamic virtual machine (VM) consolidation approach that uses a utilisation prediction model to avoid extra VM relocations and reduce SLA violations, an Integrated Green Cloud Architecture with an Interoperability element that allows corporate executives to proficiently manage work activities operation in aspects of low energy usage to private or public clouds, or simply based on user request.

Proposed an energy-efficient hybrid method for limiting cloud enabled expenses We would not only satisfy the basic performance demand, but we'll also guarantee the level of service provided to users by reducing Service Level Agreement violations. We've discussed benefits and drawbacks of Green Cloud Computing.

3.4 Conclusion

Despite these obstacles, green computing is gaining popularity. Consumer demand for environmentally friendly products is increasing in almost all commercial endeavors. Computer equipment is produced in large quantities all over the world. This has had a significant effect on the environment, especially when combined with the widespread use of digital technologies. Green computing aims to lessen the negative impact of software energy sources.

Green computing firms accomplish this by purchasing and deploying IT facilities made from eco sustainable ingredients. To manage energy consumption, they use energy-efficient computer materials and systems.

Virtualization techniques are being adopted by businesses, which mean fewer computer tools to meet the same activities. They make every effort to utilise or repurpose outdated computer parts, or, if that isn't possible, dispose of it in an environmentally responsible way.

Employees at these companies are also compelled to follow habits and procedures that allow the company reduce its ecological impact.

Green computing strategies have demonstrated how clean IT can lower expenses and increase profit margins in organisations that have implemented them. Furthermore, demonstrating corporate responsibility and being perceived as environmentally responsible by the public can attract more customers and increase revenue.

ADVANTAGES OF GREEN CLOUD COMPUTING

Conserving Energy by Green Cloud Computing:

In 2013, Google sponsored a venture to assess cloud computing's energy use and carbon output. As a result of this new project, the quantity of steady power absorbed by common software programmes like worksheets, email, and CRM platforms is decreased by 87 percent.

Cloud computing has lowered power usage to a certain level. Servers were previously stored in server rooms and needed a constant supply of power to function. Power was necessary to guarantee that the coolers, like the servers, did not overheat. As servers and coolers reach the end of their useful lives, they must be discarded. The amount of hardware on that is reduced, as is the amount of power spent, with cloud computing. Green computing and cloud computing have the goal of lowering power usage even more.

Remote working reduces the environment's carbon footprint:

Among the most significant features we consult with organizations when it comes to Cloud computing is the potential for their employees to work from wherever. The productivity growth that this functionality carries is mainly promoted, however there is a serious environment advantage to allowing more workers in your entire organisation. Because remote workers don't have to travel to work every day, the number of cars on the road reduces the amount of gas emission emitted into the atmosphere. You can also decrease your real estate impact on the planet by employing remote workers. You can get ahead with the much relatively small office and use less energy.

Going Paperless with Green Cloud Computing:

The Cloud is a secure location to keep your data. The accessing your content at any time and the additional backup functionality that assures the data is not erased out if anything happens to your hard drive.

From the other side, green cloud computing had also facilitated numerous businesses to really go paperless. With the advent of Cloud storage options such as Google Drive, going paperless has reached new heights of functionality for businesses. You can also eliminate the need to publish papers with using secure Cloud-based technology like Adobe Sign. With some clicks of a mouse, you could indeed send, sign, and store agreements and official papers using green cloud computing tools.

DISADVANTAGES OF GREEN CLOUD COMPUTING

Performance: In addition to functional efficiency and connectivity, green businesses are often assumed to be insufficient. This really is particularly the case if it is not applied correctly. Businesses that focus on super computers may see a significant drop in employees performance, which will affect the business performance.

Implementation Cost: Regardless of the fact that green computing saves money over the long term, numerous companies are cautious to shift because of the high initial investments. Putting in place a green computing system takes a lot of time and research, both of which are expensive. As a result, the system costs more than a standard version.

Security Leaks: While utilising a green computing device, there are several massive security issues. Employees working for green computing companies regularly switch out his\her workspaces and other devices. As a result, lots of new security flaws emerges. As a result, companies should indeed take preventive measures to avoid problems like this.

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