Green Cloud Computing-A Step to Environmentally Friendly Cloud Solution

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Abstract- **Each person is entitled to a healthy and sustainable environment. Here, we look at sustainability as welfare that lasts long in terms of the surroundings and economy. The cloud is adversely used in data storage since it is a secure means of storage in the current world. Green cloud computing (GCC) is highly applicable since it helps in the energy conservation and reducing toxins that it may emit to the environment, such as carbon dioxide (CO2); hence it is environmentally friendly. Therefore, green cloud computing (GCC) aims to keep the world green forever as it increases the efficiency of cloud computing.**

Keywords: *Green cloud computing*

1. INTRODUCTION

Green cloud technology uses digital space to reduce the technology's impact on the environment during production and designing—green cloud computing majors in increasing the efficiency of energy in computing and promoting environmentally friendly computer technologies. Green cloud technology does save not only energy but also enterprise organizations operational cost. Green cloud technology has highly in demand by organizations since it has covered scalability, security, and cost-effectiveness features. Growth in the market has led to an increase in energy consumption levels which has also increased the carbon emission levels to the environment. Therefore, green cloud technology has led to the manufacture and designing of subsystems, i.e., monitors, printers, and storage devices that have less impact on the environment. GREEN CLOUD refers to the benefits of an environment that Information Technology (IT) offers to society. Green computing practices include: recycling the printing papers, using virtual technologies, using electronic recycling programs, and buying from companies committed to the environment.

Cloud technology is said to be green since it minimizes energy consumption. Some of the real-world practices of green cloud computing are: putting laptops in sleep mode when not in use, using "smart trip" power strip, turning off computers when they are not in use. Additionally, green computing takes a variety of ways. It's not just concerning making environmentally friendly IT devices; it's also about the way the apps will be employed in numerous industries to promote ecological responsibility as a whole. "Recycle, reuse, and reduce" is the primary philosophy of green computing. Going green has numerous advantages for the ecosystem, but it also has certain drawbacks. It is necessary to comprehend the advantages and disadvantages of every firm, whether small or huge, to figure out why it is essential to the environment

2. GREEN COMPUTING

Green computing refers to how computing uses resources efficiently [4]. Organizations comply with green computing by setting up their operations to ensure a minimal carbon footprint. "The goals of green cloud computing are similar to those of chemistry; reduce the use of hazardous, maximize energy efficiency during the products lifetime, and promote the recyclability of defunct products and factory waste" (bid data analytics 2021).

3. BENEFITS OF GOING GREEN

Since the ultimate goal of green cloud computing is to minimize energy consumption by large data centers, it aims to include energy-efficient technologies, practice environmentally friendly production, and improve waste recycling [1].

3.1 Green Computing Works on Reduced Paperwork

Green cloud computing offers a secure cloud platform in the servers where data is stored. Cloud storage platform has also enhanced the storage of critical files in a safer place where they are free from unauthorized access. Such storage options are Google Drive, DropBox, OneDrive, and SharePoint [2] [3]. These options allow one to perform any operations with a few clicks on a mouse without printing the document. Files are accessed anywhere and at any time with an assurance of data backup that makes sure that your data still exists even in the unexpected event of disc drive or severe room failure.

In going paperless, you have to ensure you have proper management and governance across cloud servers. Green cloud computing has reduced carbon footprints.

3.2 Decrease in Stuff Members

Organizations that use cloud computing have a decrease in staff as an advantage. Such organizations should have friendly cloud abilities for their workers to figure out data across platform devices [3]. Green cloud flexibility is applicable here since it is associated with rising productivity and has superior features. Green cloud is an ecofriendly solution since it permits remote staff to operate within and from home. Decrease in staff has also reduced fuel emission discharge in the work area since the number of cars in the work area reduces [1] [2] [3].

3.3 Works on Energy conservation

Organizations switch from one software package to the other, cutting back the energy consumed. Cutting back on fuel during switching results in better power consumption and, thus, decreasing energy bills. Green cloud computing controls the operational servers relentlessly, leading to the steady cooling of features [4]. "In 2013, Google funded a project to measure energy use and carbon footprints of cloud

computing, which indicated that if organizations switched their most common software programs to the cloud they could reduce their total energy consumption by 87%" (ProServeIT 2018). Energy flow to the servers needs to be constant, ensuring that cooling servers are in place.

3.4 Cost-cutting

Green computing is extremely cost-effective and aids in the financial savings of individuals. Because green computing saves a lot of energy, it also saves money. Despite its high initial expenses, green computing is financially advantageous in the long term.

3.5 Process of Recycling

By repurposing technological trash, going green promotes recyclability. To have a lower ecological impact, several elements of the computers are made of eco-friendly components rather than plastic. This allows all electronic trash to be efficiently sorted [6]. As a result, firms may enhance their whole recyclability by employing green computing solutions.

3.6 Promoting the Product

Some clients are so worried about global warming that they will only deal with businesses that embrace green computing. Going green can shape public perceptions to boost a company's brand plus market positioning throughout the globe.

3.7 Exposure to Chemicals

Hazardous compounds, including mercury, are employed in most electrical gadgets. If humans come into touch with such chemicals, they will almost certainly suffer health consequences. Immune reactions, neurodegenerative disorders, and possibly cancer are documented health hazards [6]. Organizations that pursue green computing may avoid using non-toxic materials in hardware manufacturing. This will play a critical role in not only saving life but also, preserving it.

4. DISADVANTAGES OF GREEN CLOUD COMPUTING

The initial implementation is costly-the initial cost of setting organizational infrastructure is expensive since the purchase of electronics requires large sums of money [2].

With the frequent change in technology due to digitalization, organizations must be more flexible and upgrade as technology changes. The time change in technology levels leads to much expenditure as the organizations tend to upgrade with the difference in the level of technology [5].

Green IT causes more burden to individuals since they have to purchase the required infrastructure to access the internet. Computers are costly; hence individuals have to spend a lot to acquire these electronics. Green establishments are all the time believed to be wimpy, both in system efficiency as well as network utilization. This is mainly factual when it is not implemented as it should be. For companies that have faith in sophisticated computers, this may culminate in a noteworthy decrease in staff productivity, which may bear an undesirable effect on revenues. Furthermore, green technology's survival is not entirely reliant on a solitary individual. It is centered on every

worker's exertions plus preferences. They will need to regulate to the novel paradigm. If a single participant disagrees, the implementation strategy might be discarded. As a consequence of those persons, companies ought to migrate to green technology.

Another disadvantage is adverse safety risks when taking on a green computing infrastructure [6]. Personnel that labor for green technology firms switch their workstations plus additional gear frequently. This eventually hints to a number of safety weaknesses, comprising hacking. Thus, companies have to take the prerequisite safety measures to mitigate such problems. Also, IT specialists with a comprehensive insight in the know-how ought to be employed to operate the green IT architecture. It is not easy to find these whizzes, plus they have to be remunerated sizably if they are. Your devices may ultimately encounter downtimes as well as other technical concerns if you do not hire somebody

5. Importance

Green computing is critical because it benefits the environment. Reduced energy usage in IT organizations leads to low carbon dioxide emissions [1] [2]. Some essential green IT technologies, such as virtualization, helps save money. Virtualization enables IT managers to use either single or multiple servers in separate environments running different operating systems and serving other applications. Green computing helps in cutting energy and cooling bills. Cloud computing has reduced the workload in IT firms since most of the operations and services are cloud-based; hence the energy required in the data centers is minimal, leading to fewer cooling necessities. Rise in the green IT products. Green cloud computing has led to increased service provision by IT firms. Due to the increase in cloud technology capabilities, IT companies have increased their product due to affordable cloud conditions.

6. CONCLUSION

Green cloud operational features reduce carbon footprints and plastic usage. Popular technology giants such as Microsoft and Google have operations put in place to handle environmental-conscious parts regularly.

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