

A STUDY ON GREEN COMPUTING – AN ECO-FRIENDLY TECHNOLOGY

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Abstract: Green computing is environmentally and eco-friendly use of computers and their resources efficiently. It is the study of manufacturing, engineering, designing, operating and disposing the computing devices. Green computing is like green chemistry. Besides the widespread sensitivity to ecological issues and also stems from economic needs, since both energy cost and electrical requirements of IT industry around the world. The objective of a green computing is saving the environment. Green computing is the study and routine of utilizing assets efficiently. Green computing is a naturally capable approach to lessen power and natural waste. It is a growing significant subject that creates an urgent need to train future generation computer scientists or practitioners to think green. State Bank of India works for saving the environment with the help of green channel. Green computing is a very emerging topic these days, not only because of rising energy costs, but also due to the impact of environment. Green technology plays a very important role in terms of computing. Green computing methodologies can help us to build a protected place for us to live. we point out future directions of research and concluded the paper.

Keywords: Green computing, Economic needs, Methodologies.

I.INTRODUCTION

Green computing is the study and practice of environmentally responsible and eco-friendly use of computing concepts efficiently. Green computing is a smart computing. Green ICT as per international federation of global & green ICT "IFGICT", green IT, or ICT sustainability. Many corporate IT departments have green computing initiatives to reduce the environmental effect of their IT operations. Elements of such as solution may compromise items such as end user satisfaction, management restructuring, regulatory compliance, disposal of waste, telecomputing, energy use, and thin client solution. The goals are similar to green chemistry; which is trying to reduce the use of hazardous material, maximize energy efficiency during the products of life time, and promotes recyclability and factory waste.

These green technology is beneficial as to:

- Reduce energy consumption of computing resources.
- Save energy during idle operation.
- Use eco-friendly source of energy.
- Reduce computing waste.

The primary objective of such a program is to account for the triple bottom line, an expanded spectrum of values and criteria for measuring organizational and societal success. Modern IT systems rely upon a complicated mix of people, networks and hardware; such as, a green computing initiative must be systemic in nature, and address increasingly sophisticated problems. In the IT world the

business runs 24*7 and the transactions are made every possible channel to read, request, store and analyse huge data. The IT industries need to maintain this information in databases which are maintained in servers. Many businesses simply focus on a bottom line, rather than a green triple bottom line, of economic viability when it comes to computers. Due to the advent of social networks the data is increasing day to day efficiently. Hence, businesses and consumers can embrace environmentally sustainable products that offer low-carbon solutions that can not only reduce their global greenhouse gas (GHG) emissions, but can achieve more efficient energy consumption and lower costs. First and most conclusive research on computing shows that Carbon Dioxide and other emissions are causing global warming or climate change and environmental damage. The idea is to make computers from beginning to end a green product.

II.BACKGROUND STUDY

Green computing practices were primarily introduced by the environmental protection agency in 1992 with the launch of the energy star program. Computing technology plays a crucial role in our day to day activities. With the recent years many industries and companies have turned their attention in realizing how going 'green' can benefit public relations, reducing costs, and lowering global emissions from industrial manufacturing. It is best practices and policies should cover power usage, reduction of paper consumption, as well as recommendations for new equipment and recycling old machines. Though the term green computing focusses on ways in reducing overall environmental impact, its main purpose is to find and

Promote new ways of reducing pollution, discovering alternative technologies, and creating more recyclable products.

2.1 Government Regulation and Initiatives

Many governmental agencies have continued to implement standards and regulations that encourage green computing. And the many government worldwide have initiated energy-management programs such as Energy Star. Energy star reduces the amount of energy consumed by a product by automatically switching into "sleep" mode when not in use and reduce the amount of power used by a product when in "standby" mode. The directives placed responsibility on manufactures for the gathering and recycling of old equipment (the producer responsibility model).

2.2 Green Computing In Computers

- Switching off the computers and laptops when not in use can tremendously reduce the energy.
- A modest amount of turning on and off will not harm the computer or monitor.
- The life of a monitor is related to the amount of time it is in use, not the number of on and off cycles.
- By trying to plan our computer -related activities so we can do them all at once, keeping the computer off at other times.
- Printers consume energy even while they are idling. So not turn on the printer until not ready to print.
- If we spend a large amount of time at our computer, consider reducing the light level in our office. This may improve CRT (cathode ray tube) screen visibility as well as save energy.
- Avoiding the usage of screen savers and large screen computers can also save energy.



Fig: 1 steps in green computing

- Power-up and power-down energy-intensive blocks of time, leaving hardware off at other time.
- Minimize the use of paper and properly recycle waste papers.
- Use of local cooling software always monitors the activity of CPU and when its sits idle it immediately put it into sleep mode and also manages power consumption.

- While typing documents, especially drafts, using a smaller font and decreasing the spacing between lines, or reformat to keep our document to as few pages as possible.
- Review the document in the screen instead of printing a draft. If we print a draft, using of the blank back side of used papers.

2.3 Approaches to Green Computing

Virtualization: The process of running two or more logical computer systems on one set of physical hardware. With virtualization, a system administrator could combine several physical systems into virtual machines on one single, powerful system, unplugging the original hardware and reducing power and cooling consumption. Many small physical servers are replaced by one larger physical server, to increase the utilization of costly hardware resources such as CPU. The larger server can "host" many such "guest" virtual machines. This is known as physical- to- virtual machines.

Material Management: The European union adopted the restriction of Hazardous Substances Directive (ROHS). The directive is closely linked with the Waste Electrical and Electronic Equipment Directive (WEEE). Which sets collection, recycling, and recovery targets for electrical goods.

Tele Commuting: Telework is a broader term, referring to substituting restriction of telecommuting. All telecommuters are teleworkers but not all teleworkers are telecommuters. Telecommuting, e-commuting, e-work, telework, is a working arrangement in which employees enjoying flexibility in working location and hours. Long distance telework is facilitated by such tools as virtual private networks, videoconferencing, and voice over IP.

2.4 Recycling

Many developed countries are heavier or stronger in technology hence a huge amount of computer systems and related products are discarded every day. These products are sold out to other developing countries. Rapid technology change, low initial cost and even planned obsolescence have resulted in fast growing problem around the globe. Whole computers and pieces of electronic equipment are shredded into small pieces to be more manageable and facilitate the separation of the constituent components. Leaded glass from cathode ray tubes is sold to foundries for use as a fluxing agent in the processing of raw lead ore. The other valuable metals, such as copper, gold, silver, palladium, and tin are sold to smelters for metal recycling. The reuse of such equipment allows saving energy and reducing impact on environment, which can be due to electronic wastes. These methods allow for the safe reclamation of all the valuable materials used in computer constructions.

III. ADVANTAGES AND DISADVANTAGES

3.1 Advantage In Green Computing

- It reduces the usage of energy.
- It saves energy and resources.
- It saves money because of less use of energy.

- It reduces environmental impacts.
- It reduces the risk existing in the laptops or such as chemical known to cause cancer, nerve damage.
- And immune reactions in humans.
- It reduces the amount of pollutants and provides environment as safe.
- It reduces environmental impacts.
- It reduces the burden on paper industry.
- It reduces the energy consumption with results into low carbon di oxide emission.
- It even includes changing government policy to encourage recycling and lowering energy used by individuals.
- Stemming from a reduction in the fossil fuel used in power plants and transportation.
- Lower energy costs.
- Long lasting computing devices.
- Use preserve resource which use less energy to produce, use and dispose of products.
- It is about reducing the environmental footprint of computer.
- It also applies changing government policy to encourage recycling.
- Energy saving environmentally friend.
- It is energy efficient.
- It saves more money per year.
- Total cost savings.
- It reduced the amount of heat produced from electronic devices.
- It is our collective responsibility to safe guard our environment for our future generation.

3.2 Disadvantage In Green Computing

- It could actually be quite costly.
- Some computers that are green may be considerably underpowered.
- Sacrifices performance for battery life.
- Rapid technology change.

IV.FUTURE ENHANCEMENT

Today in India most large Data Centres (DC) consume 10-100 times more energy per square foot than a typical office building and of these data centres have become over cooled, which again eats into power needed to cool them. And the consolidation of IT resources into fewer DC's are stretching the limits. That is the one would witness that DC's are evolving at a faster rate due to which customers have to modify or redesign their DC every five years. Customers are looking for solutions that adapt to the changing needs of the data centre without needing additional investment. One should not go only by the specification; it is good idea to measure the power output from a sample device and monitor it. As a result, companies find that they need more power to run and cool this equipment. At the same time the cost of the electricity is on the rise. Many companies are trying to be good corporate citizens by becoming green (or at least greener).

The future of green computing is going to be based on efficiency, rather than reduction in consumption. To prevent

computing to have any negative effect on humans lives in future, researches had advised set of goals to follow. Sense the surrounding in a manner to keep us aware of energy consumption around the globe and its effects. While traditional computing systems will be important to execute the models on it for future, We should need to predicate and tract to the upcoming events by responding to the future behaviours by modelling our predication. The future of green computing provides the struggles for healthier and greener schools and communities.

V. CONCLUSION

The green computing represents a responsible way to address the issue of global warming. But it is not primarily motivated by eco-friendly. The primarily motivation is technology's cost. It also protect the environment by reducing energy and paper costs. As detailed above, proactive steps for a green computing merely takes effort, yet the lowered energy consumption typically translates into immediate savings. The good news for Mother Earth is that there are a lot of money savings, eco-friendly steps just waiting for IT execs to take. In this paper we conclude that Green computing is very important and smart technology for clean and green environment. Save Energy and Save Earth as Green.

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