

Green Computing: A demand of Time

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***Abstract-**In this modern era of globalization, computers play a vital role in every field, so the needs of computers increased day by day and, to full fill this needs, a large amount of electricity required for manufacturing of computers functional units, such as CPU, memory , monitors and peripheral devices etc. By this a large amount of carbon content consumes in the atmosphere. These carbon contents directly or indirectly impact us and responsible for hazards on the earth. There are many technique used by intelligent people to overcome this problem, one of that technique is Green computing. Green Computing takes responsibility of eco-friendly use of computer and their resources. The main focus of this paper is to save the energy and make environment green by providing some new techniques.*

Keywords: Green Computing, E-waste, EPA, Recycling.

Introduction

Green Computing is the emerging technology which is responsible for the manufacturing and use of computer devices by consuming less carbon. Many computers are produced from many hazardous materials like cadmium, mercury and other toxic substances. While disposing the computers, it will lead to pollution and affect the environment to great extent. The impact of the toxic waste that is produced by us through throwing our old computers and peripherals lead to land pollution [2]. This is the big challenge, how to minimize the power consumption and thereby reducing the carbon content in the atmosphere [1]. The goal of green computing is to reduce the use of hazardous materials, maximize energy efficiency during the product's lifetime, and promote recycle ability [1]. Green Computing is the name attached to this movement, which represents an environmentally responsible way to reduce power and environmental e-waste [5]. Many IT manufactures and vendors are continuously investigating in designing energy efficient computing devices, reducing the use of dangerous materials and encouraging the recyclability of digital devices and paper [6]. Its practice came in to being in 1992, when the Environmental Protection Agency (EPA) launched the Energy Star Program. EPA a voluntary labeling program that is designed to promote and recognize energy efficiency in monitors, climate control equipment and other technologies [3].

Need of Green Computing

In this time computers are used widely in every field to increase the accuracy and speed of work, but the computer is not able to work without power, that's why if the use of computer is increase it leads to



increase of power consumption and greater heat generation leads to greater emission of greenhouse gases like Carbon Dioxide (CO₂) that has various harmful impacts on the environment and natural resources. Many of the people are not aware that the CPU and fan consume power; screen savers consume power even when the system is not in use. Insufficient power and cooling capacities can also result in loss of energy. This all becomes responsible for the polluted environment [2]. It is also observed that most of the data centers used old technologies based system and they don't have sufficient cooling capacities [1]. This all leads us towards the polluted environment. The environment pollution could be because of the defects in Manufacturing techniques, packaging, disposal of computers and components. There are toxic chemicals used in the manufacturing of computers and components which can enter the food chain and water [2]. It is observed from one source, "Information Technology energy demand is growing Twelve times faster than the overall demand for energy" and Data centers emit 150 metric tons of CO₂ per year, and the volume is increasing rapidly [xc].

In order to create standards and regulations various organizations have been formed. Some of these organizations are:

1. The Green Grid is a global pool of IT companies and professionals looking for improve energy efficiency in various data centers around the globe. Board members of the The Green Grid include AMD, EMC, Intel, APC, HP, Microsoft, Dell, IBM, and Oracle [2].

2. The U.S. Environmental Agency is a government agency that was created to protect human health and to safeguard the natural environment [7].

These organizations were formed to reduce the green gas emission and other pollutants caused by the inefficient use of energy; and Make it easy for consumers to from the view of a user in an organization.

Technologies used to maintain Green Computing

Carbon free computing: Due to increase in (CO₂), Methane, and Nitrous oxide are the reason for earth increasing temperature which leads to global warming, severe floods and drought. So to overcome this, VIA technologies works with environment experts to calculate the electricity used by the device over its lifetime generally three years. From this data, one can conclude how much carbon dioxide the device will emit in to the atmosphere during its operation [3].

Solar Computing: The venture of VIA technologies and Mo-tech industries to develop fully solar power devices that are non-polluting and highly reliable [1].

Energy efficient computing: VIA is taking a initiative for the development of energy-efficient platform for low-power small form factor (SFF). VIA introduced in 2005 the VIA C7-M and VIA C7 processors that have a maximum power consumption of 1W. This processor produced over four times less carbon during their operations and can be efficiently embedded in solar devices [1].

Effective steps to maintain Green Computing

1. People must switch off their computer at night so it runs only eight hours a day- it will reduce energy use by 810kWh per year and net a 67 percent annual savings.
2. Flat screen monitors use less energy and such monitors are not as hard on our eyes as CRT'S.
3. Unplug the electronic if not in use.
4. A small monitor- a 14-inch display uses 40 percent less energy than a 17 inch one.
5. Enable sleep/ stand mode is an effective way to conserve battery in a laptop computer.
6. Power off your monitor when you are not using it instead of using screen savers.

7. Buy vegetable or non-petroleum-based inks—they are made from renewable resources require hazardous solvent.
8. Recycling of Electronics Waste is more effective because recycling process is more environmentally friendly than the process of making new stuff because it can reduce the use of new raw materials, land degradation, pollution, and energy usage [10].
9. Use network printer in a business organization to save the paper and energy [4].

Conclusion

In this paper it is analyzed that the main motive of Green Computing is the low amount of power consumption to save time and money. There some IT industries those are working on this concept. In this paper we have also focused on some technologies and techniques to make the Green Computing successful. So Green Computing is the emerging technology which is more over like aid and need to sustain the eco friendly environment.

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