A REVIEW OF GREEN COMPUTING: RECYCLING AND REUSAGE

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Abstract
In *the world of* information and communication technology, *computer resources* are are playing a great role to fulfill the variety of *needs* related to daily life. *Computer has become the basic needs ofvarious activities. Green computing concept focus on the utilization of computer resources in efficient way to minimize the environment impact. To* save the energy and power, green computing promote the use *of LCD instead of CRT monitor*s. *Green Computing focus on how to recycle such hazardous material produced from computer garbage.Howevervarious machines with three or four stars rating have been introduced by this concept.* This paper *describe*s *the various techniques which explain how the hazardous material of computer garbage can be recycled which wreak chemicals like lead, cadmium etc.*
Keywords: Green computing, recycling, computer garbage

I. Introduction

Green computing is basically a term which tends to provide a eco-friendly use of computer and related resources. In other words, it is also defined as the study of designing, manufacturing, using and disposing of computing apparatus in such a way which wreak the negligible environmental impact. Green Computing [1] can be viewed in various contexts, environmentally, socially and politically with respect to effective utilization of energy that result in reduction to carbon emission/footprints, recyclability, bio degradability, and minimal impact to the environment. Consumption of computer resources and environmental electric waste can be reduced by using the concept of Green Computing[2]. Green Computing is categorized into further two concepts [3]: Green IT and IT for Green. Quantity of Carbon Dioxide is increasing in environment that wreak the damage and other types of environment hazards. Thus there is urgent need of Go Green strategy which reduce the consumption of overall energy of communication, computation and storage.

I. Need of Green Computing

Today, Computer plays a vital role in our lives. It makes the life easier as it saves the time and increase the efficiency of the work. But the electronic devises and gazettes consumes lot of power and produces greenhouse gases and also increase the pollution.One important reasons among number of causes of consumption of power is leaving the systems on even not being in use. Data centers require a lot of power and also require matching cooling system to balance the power and energy level when it is not available then it causes the environmental pollutions. So Go-Green is demand of today to save the lives by making the environment healthy[2]. There are many steps that can be implement to save the power consumption and reduce the emission of greenhouse gases like virtualization, recycling the E-waste, Cloud Computing etc.

The aim of green computing is similar to green chemistry which prefer to reduce the use of hazardous materials, effective utilization of energy during the product's lifetime, and promote the recyclability of non-working products and wastage of factories. Number of IT departments of corporate are devoting time and investing money in green computing initiatives to overcome the environmental impact. Main goals of their IT operations and research are to provide the healthy environment by reducing the use of hazardous material, toxic, improve r rvand other peripherals to reduce the power consumption.

II. Advantages Of Green Computing

Advantages of green computing are as follows[2]

1. Green Computing techniques decrease the usage of energy which results into lower carbon dioxide emissions, stemming from a reduction in the fossil fuel used in power plants and transportation.
2. Conserving resources means less energy is required to produce, use, and dispose of products.
3. Save the energy in the duration of idle operation.
4. Saving Money due to proper utilization of energy and resources.
5. Green computing promotes policy of changing government to encourage recycling and lowering energy.
6. Reduce the risk of cancer, nerve damage and immune reactions in humans due to chemicals existing in the laptops.

III. Implementation of Green Computing

The following are the some actions or strategies that ensure the implementation of green computing [4].

1. Energy Efficient Data Center Design – The design or infrastructure of energy efficient data center must include air management, heat recovery strategy and electrical configuration of data centers in proper manner that reduces the energy consumption to a great extent[4]. The design of modern data center also have facility of on-site electricity generation and recycling of waste.

2. Use of Energy Star Labeled Products – Energy star labeling on electronic devices indicates the energy efficiency of the appliance like refrigerator, TV etc., which varies between one to five stars. Efficiency becoming higher with increasing number of stars. So Higher rated appliances promotes the idea of go Green by saving the energy.

3. E-Waste Recycling – The concept of E-waste recycling means to reuse the wastage ofmaterials of old computers, monitors etc. Many developed countries strong in technology discard the large amount of devices and electronic gazettes every year and sold out to other countries. Instead of throwing the obsolete items, can contribute to the non-profits and charities or send it to the municipal or private recycling bodies [5].

4. Telecommunication – It is related to work arrangement which encourage the people to work from home, making use of the internet, telephone and e-mail. The terms teleconferencing, telework or telepresence are often used interchangeably that can be seen as a method to implement green computing. These technologies wreak many advantages such as decreasing the emission of greenhouse gases related to travel, enhance work satisfaction and lower costs for office space, heat and lighting.

5. **Cloud Computing –** Business are growing at very rapid speed due to updated technologies and requirements of daily lives. Therefore it requires the large infrastructure and productions of variety of products and services. Cloud computing [5] is very popular term used to save energy in word of business as it provides the pay per use facility for utilization of Infrastructure, energy, resources etc. The customers can use the resources according to their need. Thus Cloud computing [6] is a popular technology to implement the concept of green computing.

V. CONCLUSION

This paper provides future directions for promoting the idea of green computing. The paper focus on the definition and basic concepts related to green computing. The today needs of society are Recycle, Reuse and Regeneration. Different advantages of green computing have been discussed and conclude that a major positive change can be made to environmental conditions after implementing the various ideas of green computing. Hence Green computing is the urgent need of the time.

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