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AN ENERGY- EFFICIENT GREEN COMPUTING

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Abstract:

In today's climate, it is difficult to ignore the ongoing concerns about climate change and the environment. This paper presents concept of Green Computing and how we can adopt it in our daily life to improve the deteriorating environmental conditions. In the article Harnessing Green IT: Principles and Practices, San Murugesan defines the field of green computing as "the study and practice of designing, manufacturing, using, and disposing of computers, servers, and associated subsystems—such as monitors, printers, storage devices, and networking and communications systems — efficiently and effectively with minimal or no impact on the environment. In detail we can say that Green computing or green IT, refers to environmentally sustainable computing or IT whose goals are to reduce the use of hazardous materials, maximize energy efficiency during the product's lifetime, and promote the recyclables or biodegradability of defunct products and factory waste. Green Computing concentrates on energy efficiency, reducing resource consumption and disposing of electronic waste in a responsible manner. Green computing is the environmentally responsible use of computers and related resources. Such practices include the implementation of energy-efficient central processing units (CPUs), servers and peripheries as well as reduced resource consumption and proper disposal of electronic waste known as e-waste Computers today have become a necessity not only in offices but also at homes. Computers also have made doing various tasks very easy and efficient; they pose a great problem which is effecting the environment adversely. As the number of computers is increasing day by day, so is the amount of electricity consumed by them which in turn is increasing the carbon content in atmosphere. This problem has been realized by the people. Measures are being taken which help which help in minimizing the power usage of computers. This can be called as Green Computing. In a deeper sense, Green Computing is the study which lays stress on the operation of computers and related peripherals in order to minimize the carbon footprint. Green computing strategies can help us to build a safe place for us to live in. If each one of us becomes aware of all these things, we can make our environment healthy not only to live but also to live a long life.

KEYWORDS:

Green Computing, E-waste, server, Peripherals, Energy star, Recycling.

INTRODUCTION:

When we heard the term green computing the first Idea that came into our mind was "going green with computers" but the questions that strike our Ideas mind at the same time was HOW and WHY to "go green", and in the guest for finding the answers to our question we landed us with the conclusion "GREEN COMPUTING – GREAT COMPUTING". This research was of ours has given us a new perspective to

think in the direction that technology does not only mean to accomplish our tasks but also make sure that our technology is not harming the environment around us. This environmentally sustainable computing can be defined as "the study and practice of designing, manufacturing, using, and disposing of compute ring and associated subsystems such as monitors, printers, storage devices, networking and communicating systems efficiently and effectively with no impact on the environment."

Hence computing is the environmentally responsible use of computers and related resources. Such practices include the implementation of energy-efficient central processing units, servers and peripherals as well as reduced resource consumption and proper disposal of electronic waste (e-waste). Green computing includes the dimensions of environmental sustainability, the economics of energy efficiency, and the total cost of ownerships, which includes the cost of disposal and recycling, and the total cost of ownership, which includes the cost of disposal and recycling. It is important to understand and the need of the study of green computing. Green computing is a very hot topic these days, not only because of rising energy costs and potential savings, but also due to the impact on the environment.

A BRIEF HISTORY OF GREEN COMPUTING:

One of the earliest initiatives toward green computing in the United States was the voluntary labeling program known as Energy Star. It was conceived by the Environmental Protection Agency (EPA) in 1992 to promote energy efficiency in hardware of all kinds. The Energy Star label became a common sight, especially in notebook computers and displays. Virtualization practices, e-waste, etc. Similar programs have been adopted in Europe and Asia.

Energy Star served as a kind of voluntary label awarded to computing products that succeeded in minimizing use of energy while maximizing efficiency. Energy Star applied to products like computer monitors, television sets and temperature control devices like refrigerators, air conditioners, and similar items. One of the first results of green computing was the Sleep mode function of computer monitors which places a consumer's electronic equipment on standby mode. When a pre-set period of time passes when user activity is not detected. As the concept developed, green computing began to encompass thin client solutions, energy cost accounting.

NEED OF GREEN COMPUTING:

Our so called technically successful world almost sounds fake. We have great machines and equipments to accomplish our tasks, great gadgets with royal looks and features make our lives more impressive and smooth. Today almost all streams weather its IT, medicine, transportation, agriculture uses machines which indirectly requires large amount of power and money for its effective functioning. It's OK that we are happy with ourselves, we are completing all our work on time everything is working smoothly and effectively, we are earning large amount of money and living a luxurious life but we have never given a thought that what sort of a achievement is it we have achieved what we desired but we never ever realize that in this journey of ours what have we return to natural surroundings. The air which we breathe, the water that we eat and the soil on which we live is contaminated with hell lot of pollutants which are acting back upon us and harming us. Newton's Third Law of Motion states that "For every action, there is an equal and opposite reaction," therefore, consumption of energy sources has a negative reaction on the environment. Datacenters use a large amount of power and consequently cooling energy is needed to counteract the power usage. It can be an endless circle of energy waste hence the three main reasons that made us realize that need for growing green are

1.Release of harmful gases from electronics.
2.More utilization of power and money.
3.Increase of E-waste and their improper disposal.

Why is it that we humans tend to believe what we see but we are never bothered about the invisible consequences or say the after effect of the work we are doing and turn our emphasis only on our profits. We see that we need AC's, refrigerators, inverters, computers for our comfort, we go and spend large amount of money on such things and use them continuously for hours without thinking that these machines that we are using are consuming these machines that we are using are consuming large amount of power generated from natural resources. We fail to bother that the AC a refrigerators we are using are releasing harmful gases like CC which is indirectly harming us.

We will not worry ourselves even after knowing that the battery of inverter releases harmful chemicals like head and will place that inverter in the central location of our house even after being very

much aware of the fact that the presence of lead in the air we breathe causes various lung diseases like cancer, asthma etc. we know that we need computers more than anything, today in our hectic schedules we are completely aware of the thing that we can't survive without computers just because they help to us accomplish our tasks in lesser time. But we fail to analyze that the computer which we are using for hours and hours is releasing so much amount of heat and returning large amount of green house gases like CO_2. This is resulting in problems like global warming back to the environment, and what global warming is giving to us is visible to all of us in forms of floods, melting of glaciers, droughts, increase in temperature of earth surface. This contributed to almost 15% of the total deaths in last 5 years. We here are not trying to say that we should stop the usage of these electronics. Today it is next to impossible for us to avoid the usage of such things but here we want to emphasize on the fact that how due to our careless nature we tend to increase the amount of danger caused to us and the surrounding environment.

PREVIOUS EXISTENCE:

When we went into our search work we gave a flash back to the earlier works undertaken all over the world in the field of Green IT, and we discovered that one of the first manifestations of the green computing movement was the launch of the Energy Star problem back in 1992.

Energy Star served as a kind of voluntary label awarded to computing products that succeeded in minimizing the use of energy while maximizing efficiency. Energy Star applied to products like computer monitors, television sets and temperature control devices like refrigerators, air conditions, and similar items. It is becoming progressively more important for all businesses to act in an environmentally responsible manner, both to fulfill their legal and moral obligations, but also to enhance the brand and to improve corporate image.
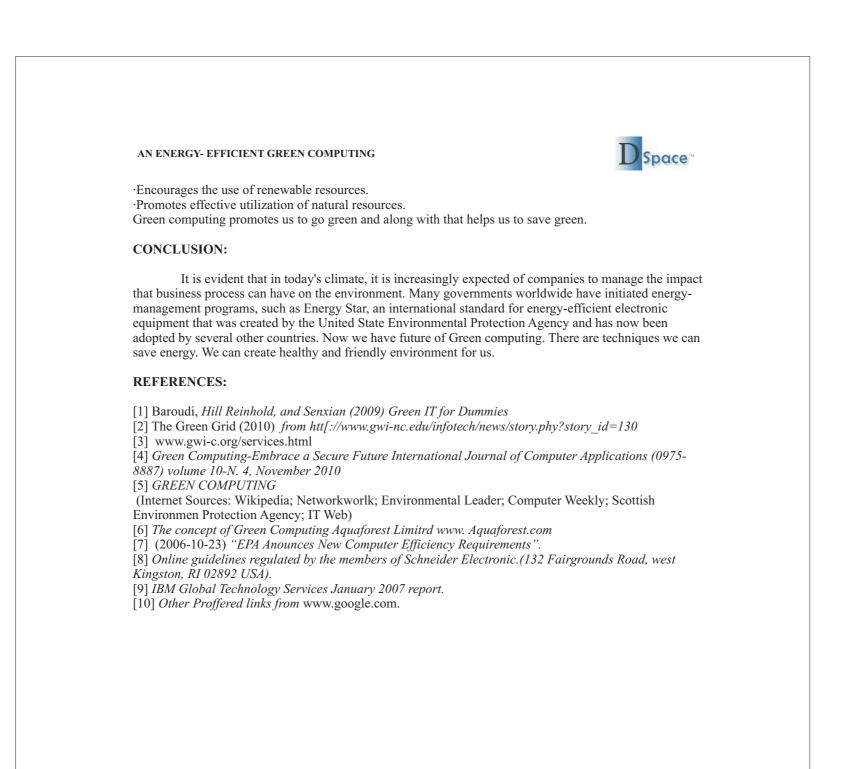
EPEAT (Electronic Products Environment Assessment Tool) - Registered computer products have reduced levels of cadmium, led, and mercury to better protect human health, and are easier to upgrade and recycle, in addition to meeting the government's Energy Star guidelines for energy efficiency. By buying EPEAT Registered products purchasers are significantly contributing to reducing the environmental impacts of their computers. Companies are competing in an increasingly 'green' market, and must avoid the real and growing financial penalties that are increasingly being levied against carbon production as solving the related problems of rising energy costs and environmental damage will be extremely painful and costly, and those perceived as being responsible will be increasingly expected to shoulder the biggest burden of the cost and blame. A fresh approach to IT and power is now needed, putting power consumption at the fore in all aspects of IT- from basic hardware design to architectural standards. IBM has a real appreciation of these issues, thanks to its size, experience and expertise, and can help its customers to avoid the dozens of 'wrong ways' of doing things, by helping to identify the most appropriate solutions. According to the company sources, IBM in 1990 saved around 4.6 billion KWH of electricity and prevented almost 3 million me tic tones of CO_2 emissions. So, essentially a reduction in wastage and recycling of the used materials is what is required to ensure green IT. There have been multiple approaches to green computing.

BENEFITS OF GREEN COMPUTING:

We might not realize the benefits of green computing when e look at ourselves using a PC for about an hour a day thinking that how can we contribute to the increasing pollution just by using a PC for a fraction of time in the whole day but the moment we will widen our view we will realize why we actually need to adopt green computing and how very few things if taken care of can change the present scenario completely. Bill Gates predicted many years ago of a PC in every home. He was widely considered to be simply promoting an unlikely scenario with the aim of boosting Microsoft's prompts. However, how right he truly was. Not just at home but also virtually every commercial organization of any size is heavily reliant upon IT. At home there is little we can do regarding our PC's switched on unnecessarily, but for organizations there is massive scope for affecting energy use, recycling, the public image, and profits through adopting a green approach to IT. Green computing strategies can help us to build a safe place for us to live in. If each one of us becomes successful in constructing a healthy environmental balcony for ourselves then trust us we can together make our mother earth a healthy and a happy place for us to survive here.

·Reducing the amount of pollutants present in the surroundings.
·It saves the power consumption and reduces amount of heat produced from the electronics.
·It reduces the burden on paper industry.

·Encourages the use of renewable resources.
·Promotes effective utilization of natural resources.
Green computing promotes us to go green and along with that helps us to save green.

CONCLUSION:

It is evident that in today's climate, it is increasingly expected of companies to manage the impact that business process can have on the environment. Many governments worldwide have initiated energy-management programs, such as Energy Star, an international standard for energy-efficient electronic equipment that was created by the United State Environmental Protection Agency and has now been adopted by several other countries. Now we have future of Green computing. There are techniques we can save energy. We can create healthy and friendly environment for us.

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