

GREEN COMPUTING “*The need for Today*”

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Abstract: In the past few years, the whole world of computers has shifted from desktop to remote data centers and the hardware and software services which are required are available based on pay as you go which in other terms is nothing but Cloud computing. Services provided are IAAS, PAAS, SAAS. Green Computing refers to the practice of using computing resources in an environment friendly way without hampering the overall computing performance. Computer and computing resources has been a key factor for Global warming as well environment pollution. This paper is a survey of how green computing can be achieved and apply in day to day life.

Index Terms: Green Computing, Cloud Computing, Global Warming, Environment.

I. INTRODUCTION

The word “Green” has now become a popular word for describing things that are healthful and good for the environment. Green as a color also signifies that it is safe and we can proceed ahead with it. The color “Green” also resembles plants, trees which is nothing but environment. Going “Green” means you must reduce one’s energy use as well as pollution which harms the environment.

Green Computing refers to manufacturing, disposing, recycling of electronic and computer devices. The aim of Green computing is to lower down the use of toxic and hazardous materials and maximize energy efficiency and popularize recyclability of products and factory waste.

The ideas of Green computing must go through the following steps: -

- 1) Design: - design energy-efficient and environment friendly components, computers, servers, data centers and cooling equipment.
- 2) Manufacturing: - manufacture computers, electronic components, and other associated subsystems with minimal or no impact on the environment.
- 3) Use: - reduce the energy consumption of computers and other information systems as well as using them in an environmentally friendly manner.
- 4) Disposal: - reuse old computers and recycle unwanted computers and other electronic equipment.

II. HISTORY

Green Computing started off as a program known as Energy Star. It was first created back in 1992. The U.S Environment Protection Agency were the ones who started Energy Star. Energy Star awarded products if they saved energy, while they were still getting the job done. The energy star program was applied to all kinds of electronic devices such as printers, televisions, etc. Even refrigerators use energy star. Energy Star created the sleep, standby mode on a computer when it is on, but not being used. As it developed over time, it began to get the name green computing. One of Green Computing’s latest programs is tactical instrumentalists. It is not very good because it mainly focuses on cost rather than helping save energy. Over the years, green computing has helped save energy for a lot of people.

III. NEED FOR GREEN COMPUTING

Today, the main problem of the world is Global warming. The atmosphere is becoming hot and is causing many problems to living organisms. Computers also play an important role in polluting the world. Today almost all the streams use computers which requires large amount of power for its effective functioning. The increase in the use of computers also increases power consumption and generate greater amount of heat. There are toxic chemicals used in the manufacturing of computers which cause

tremendous effects on the environment during its disposal. To decrease these impacts on environment, the term Green Computing has come into existence. With the help of Green Computing, we can...

- dispose electronic-waste according to federal, state and local regulations.
- Reduce carbon footprints.
- Make use of the existence technology wisely and deploy new technology if needed.
- Decrease the use of toxic chemicals and materials which causes harm to the environment.
- Manufacture electronic products which will consume less power and generate less amount of heat.
- Recycle electronic products in a manner which will not harm the environment.
- Evaluate any system and technology before adopting it.

NOTE: - Each computer generates **1 ton** of CO₂ every year.

IV. MEASURES OF GREEN COMPUTING

The ways in which computer users and businessmen use their system can be modified to minimize the impact on environment.

The measures taken are: -

1. **Virtualization:** -

Computer virtualization is the process of running two or more logical computer systems on one set of physical hardware. This concept originated with the mainframe operating systems of the 1960s, but was commercialized for x86-compatible computers only in the 1990s.

2. **Efficient processors:** -

More-efficient processors are another critical energy saving element, as Intel, Advanced Micro Devices, and Sun microsystems all have adopted the green technology. Sun is betting on multicore chip efficiency to fuel interest in new high-end servers.

3. **Screen Savers:** -

One of the simplest and most familiar power saving methods is the proper use of screen savers. The typical graphical screen saver originally designed to minimize "burn-in" of computer monitors, increases power consumption. Power use easily can be reduced by disabling screen savers. Power consumed by intensive graphics is eliminated, leading to the monitor "falling asleep" after a period of idling, automatically conserving still more power.

4. **Monitor Sleep Mode:** -

Allowing the monitor to fall asleep after idling for some period is another easily employed method for improving energy efficiency. When a monitor falls asleep or enters a "Standby" mode, it enters a low power consumption state. The monitor screen will be blank, with no light emitting from it.

5. **System Standby Mode:** -

System standby is one of the most effective power saving features. After a preset idling period, a computer will shut down most of its components significantly reducing power use. Volatile memory remains active so that whatever the user was working on will still be there when the computer wakes up from standby mode. The power button of most computers can also be configured to send the computer into standby mode rather than shutting it down, further enabling users to conveniently save power.

6. **Hibernate Mode:** -

The hibernate mode goes one step further than standby mode by completely powering off the computer. Invoking the hibernate mode causes the memory state to be saved onto the hard disk before powering down. When coming out of hibernate mode, the computer restores the memory state, returning the computer to its pre-hibernate state. A desktop computer will consume approximately 3 watts in hibernate mode vs. 5 watts for standby.

7. Purchase Efficient Devices: -

Inevitably, a computer will need replacement. When purchasing a new computer, special attention should be paid to several criteria. The computer should be energy efficient, following a compliance standard such as Energy Star, indicating a recognized conformance to low energy use goals. The manufacturer of the new computer should have a recycling program for used computers to reduce waste.

8. Cloud Computing: -

With the help of cloud computing, the servers and machines can be made on cloud which is called as a Virtual Machine (VM). It does not consume energy nor harms the environment. No toxic materials are used to provide these machines. They are environment friendly and cost less.

9. Manufacturing: -

New manufacturing techniques and environment friendly materials should be used while making any electronic product.

10. IT companies: -

IT companies should take these challenges as a strategic opportunity and should address these with a positive manner which will help them to grow their company. Also, social awareness about green computing or green IT is a must among people which needs to be done by these companies while launching their own products in market.

V. FUTURE REQUIREMENTS

- Use environment friendly materials to build processors, machines etc.
- New manufacturing techniques is required which will produce products which will emit less carbon, will consume less energy and will be recyclable.
- Adopt virtualization and cloud computing so that servers and machines can be made on cloud which has no impact on environment.
- Use of alternative energy resource like solar panels can be made where ever possible.

VI. CONCLUSION

Green computing presents a responsible way to address the issue of global warming. Also challenges of green IT is immense; however, recent developments indicate that the IT industry has the will and conviction to tackle our environmental issues head-on. Companies can benefit by taking these challenges as strategic opportunities. The IT sector and users must develop a positive attitude toward addressing environmental concerns and adopt forward-looking, green-friendly policies and practices.

Green IT is a hot topic today and will continue to be an important issue for several years to come. Consumers haven't cared about ecological impact when buying computers; they've cared only about speed and price. Devices use less and less power while renewable energy gets more and more portable and effective. The greenest computer will possibly contain the entire feature to save energy and protect our environment and health. The green computer will be the product of years of improvements over its previous models.

VII. REFERENCES

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