

Case Study on Green IT and Management

Ms.Shital Jadhav

Department of Computer Science
STES's, Sinhgad College of Sciences Pune, Maharashtra, India
shital_jadhav6@yahoo.com

Abstract: Reduction of Global Warming is the biggest challenge that we have in front of us today. It is affecting our lives a lot and creating a big fear for our future generation. So it is essential for us to turn to green. Green Computing is one of the aspects of turning to green. The purpose of writing this paper is nothing else but to introduce green computing and its management.

Keywords: Green Computing, virtualization, power management, Global warming, Green IT

I. INTRODUCTION

Many of us are not even aware of what exactly does Green Computing means. So let us first focus on simple definition of Green Computing.

“**Green Computing** also known as **Green IT** is the study and practice of Designing, Manufacturing, Using and Disposing of computers, servers, and associated subsystems efficiently and effectively with minimal or no impact on environment.” [1]

In other words we can say that green computing is nothing but carrying out eco-friendly use of computing.

II. WHY DO WE NEED GREEN COMPUTING?

- Green computing is helpful for solving our main problem that is global Warming
- Green computing can reduce CO₂ gases which are responsible for wear out of Ozone layer.
- Fertile, healthy, hazardous-chemicals free soil is necessity of agriculture. Computers play a great role in polluting soil as its made up of various chemicals like lead, mercury, cadmium and also gases like arsine, phosgene, saline etc. Green computing is again going to help us stop that.
- The gases released during use of computers or from the waste of computers may also harm our skin and cause many diseases. Respiratory problems may occur.

III. HOW DOES COMPUTING HARM ENVIRONMENT?

Computing harm our environment in many ways. Let us take a look on it:

Computers run on electricity and electricity is produced by burning coal/oil. This process releases Co₂, sulphur, methane and other such gases (termed as greenhouse gases) into the atmosphere. These greenhouse gases accumulate and result in Global Warming. They also cause respiratory diseases, acid rains etc. Another factor that is a major cause of concern to the environment is the disposal of computer peripherals like monitors which end up polluting land and water. [2]

We cannot stop using computers of course because they are important part for our progress and they make our lives easy, fast and lavish. Computers are best way of communication. They have many benefits but they are also harming our environment which is also biggest issue. So “Green Computing” is solution for all this.

Government’s initiative towards computing.

- Many governmental agencies have continued to implement standards and regulations that encourage green computing. The Energy Star program was revised in October 2006 to include stricter efficiency requirements for computer equipment, along with a tiered ranking system for approved products.
- By 2008, 26 US states established state-wide recycling programs for obsolete computers and consumer electronics equipment. The statutes either impose an "advance recovery fee" for each unit sold at retail or require the manufacturers to reclaim the equipment at disposal.
- In 2010, the American Recovery and Reinvestment Act (ARRA) was signed into legislation by President Obama. The bill allocated over \$90 billion to be invested in green initiatives (renewable energy, smart grids, energy efficiency, etc.) In January 2010, the U.S. Energy Department granted \$47 million of the ARRA money towards projects that aim to improve the energy efficiency of data centers. The projects provided research to optimize data center hardware and software, improve power supply chain, and data center cooling technologies.[1]

Some parts of Green Computing we should look towards:

- **Virtualization:**
With virtualization, a system administrator could combine several physical systems into virtual machines on one single, powerful system, thereby unplugging the original hardware and reducing power and cooling consumption.
- **Power management:**
The Advanced Configuration and Power Interface (ACPI), an open industry standard, allows an operating system to directly control the power-saving aspects of its underlying hardware. This allows a system to automatically turn off components such as monitors and hard drives after set periods of inactivity.

- **Storage:**
Smaller form factor (e.g., 2.5 inch) hard disk drives often consume less power per gigabyte than physically larger drives.
- **Display:**
CRT monitors typically use more power than LCD monitors. They also contain significant amounts of lead. LCD monitors typically use a cold-cathode fluorescent bulb to provide light for the display. Some newer displays use an array of light-emitting diodes (LEDs) in place of the fluorescent bulb, which reduces the amount of electricity used by the display. Fluorescent back-lights also contain mercury, whereas LED back-lights do not.
- We should keep habit of using the computer devices with more durability.
- Switch off the devices when not in use is necessary part for both to save electricity.
- Use the devices which have long battery life.
- Reduce the brightness of the device.
- Recycle the devices instead of throwing them anywhere.
- Maintaining PC in good condition is one step towards Green computing.
- Use of low power desktop or laptop (40-90 watts) is beneficial instead of high power desktop (eg.300 watts) [1]
- If you're using a CRT monitor, choose dark backgrounds for your screen display since bright-colored backgrounds consume more power. If you're using an LCD monitor, the opposite is true.[3]
- Reduced paper waste by
 - printing as little as possible;
 - reviewing document drafts and emails onscreen instead of printing them out;
 - using email instead of paper memos and fax documents when possible; and
 - using the double-sided printing functions on your printer.[3]

Advantages of Green Computing

- Green computing reduces energy usage.
- As less energy is used resources like fossil fuel used in power plants is reduced.
- Saving energy and resources leads to save money.
- Implementation of Green computing reduces hazardous gases that affect environment during disposal of IT waste.
- Green computing even includes changing government policy to encourage recycling and lowering energy use by individuals and businesses. [4]
- Reduce the risk existing in the laptops such as chemical known to cause cancer, nerve damage and immune reactions in humans. [4]

“As there are two sides of coin Green Computing also have other side i.e.

Disadvantages of Green Computing:

- Green computing could actually be quite costly.[4]
- Some computers that are green may be considerably underpowered.[4]

IV. CONCLUSION:

Green Computing can lead to clean, safe environment. It will reduce gases like CO₂ & CFC. We will be able to use IT devices without any harmful effect of it on environment & also to our future generation. So come on let us get green and start Green Computing.

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