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Green Computing Perspective Study

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ABSTRACT

Green computing is defined as the efficiently and economically use of resources such as printer, monitor, memory and peripheral devices in computing in which organization adopt a policy of ensuring that setup operation of information's. Green computing is an umbrella term, referring to an eco-conscious way of developing, using and recycling technology. So it is also known as green technology. There are several applications of green computing but mainly use of green computing in business and IT industries. In this paper, we describe only review of the green computing so that to understand the concept of green computing. Firstly, to introduce the green computing, to describe why go green, objectives , origin, at present, latest implementation and future of it.

INTRODUCTION

Green computing is the eco-friendly use of computers and their resources in a way to support the environment. It is the practice of using various computing resources efficiently. The primary goals are to reduce the use of hazardous materials, increase energy efficiency during a product's lifecycle, and promote recyclability or biodegradability of obsolete products and factory waste. In recent years, several IT industries have come to realize that going green is in their interest, both in terms of opportunity costs and public relations. This article will take a look at several green initiatives currently ongoing in the IT industry, as well as issues that have been raised regarding these actions. To plan successful IT solutions that helps in reducing power consumption and environmental shock, IT architects must also consider the environmental impact on other engineered quality plan as a part of every design goal. This includes name services, substitute and readjustment, management systems and network infrastructure. Green computing is also known as green information technology (green IT).

Sustainable Intelligence: Understanding Energy Consumption and Environmental Impact

As an industry division, data centers are one of the hot growing energy consumers. Why?

• IT systems are taxing suitable amounts of energy to power more and more solutions. Architects are designing systems with significantly more complicated stable processing components.

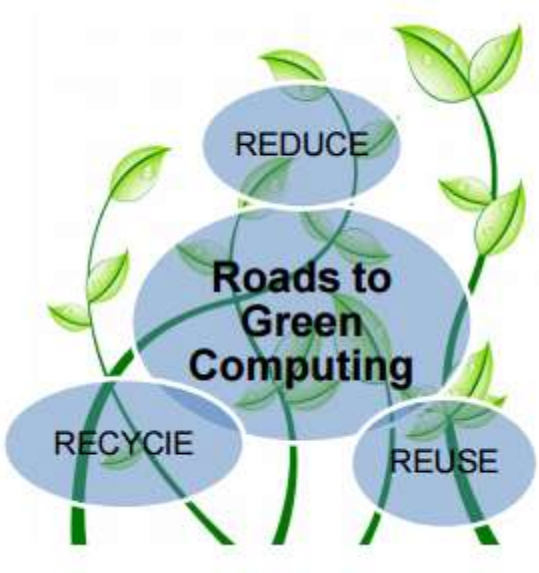
• Energy consumption from physical servers has increased severely in last five years.

• New IT solutions are being popularized into the enterprise at a velocity that significantly outrun solution retirement. Energy Consumption Institutions are achieving that the source and amount of their energy consumption share greenhouse gas (GHG) emissions. Following reaction to this awareness, organizations are currently using the following formulated equation :

Reduced energy consumption
= reduced GHG's
= reduced working costs for the data center and business

For planning models, it means embracing fewer and more energy efficient systems while redistributing application environments to make judicious use of physical as well as influencing providers that are more energy and GHG-efficient. Green computing aims to attain economic growth and improve the way computing devices are used. Green IT practices include the growth of environmentally feasible production practices, energy efficient computers and improved disposal and recycling procedures. To boost green computing approach at all possible levels, the following four complementary approaches are employed:

- **Green use:** Reduce the electricity consumption of computers and their peripheral devices and use them in an eco-friendly manner
- **Green disposal:** Re-build an existing computer or appropriately disposing of, or recycling, unwanted electronic equipment
- **Green design:** Designing energy active computers, servers, printers, projectors and other digital devices
- **Green manufacturing:** Minimizing decay during assembling of computers and other subsystems to reduce the environmental impact of these activities.



Government administrative control also actively work to promote green computing concepts by introducing several spontaneous programs and regulations for their implementation. Average computer users can employ the following general approach to make their computing usage more green:

Use the hibernate or sleep mode when• away from a computer for protracted periods Roads to Green Computing REDUCE

REUSE RECYCIE

- Use LCD or LED monitors, instead of conventional cathode ray tube (CRT) monitors

- Buy energy efficient notebooks/ laptops, instead of desktop computers
- Activate the power management features for controlling energy consumption
- Make proper plan for safe electronic waste disposal
- Turn off computers at the end of each day
- Try to refill printer cartridges, rather than buying new ones
- Instead of purchasing a new computer, try refurbishing an existing device

OBJECTIVES

Climate Change: First and main, definite research shows that CO2 and other emissions are causing global climate and environmental harmful. Our valid goal is to maintain a planet because it aims to preserve life.

Savings: Green computing can serve as a serious cost savings over time. Reductions in energy costs from servers, cooling, machines and lighting are providing us a lot of savings for many corporations.

Reliability of Power: As energy demands in the world go up, energy deliver is waning or flat. Also, now more companies are producing more of their own electricity, which keep power consumption low.

Power Consumption has come to a serious Point: Data centers have run out of usable power and cooling due to high densities

Why Go Green?

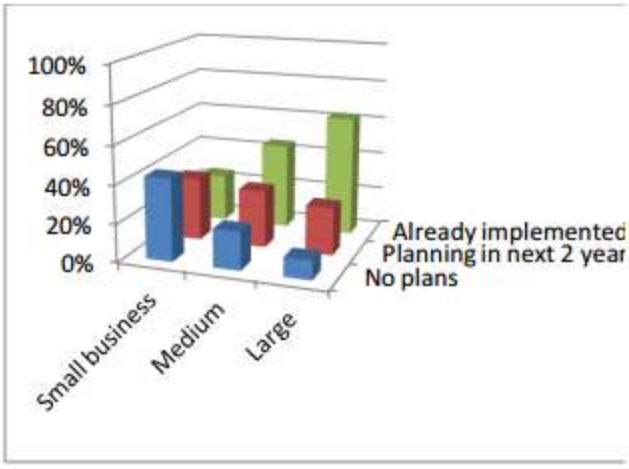
Now a day's Green computing is a very hot topic, because it does not only rising energy costs and possible savings, but also due to the force on the environment. To operate, manufacture, cool, store computing systems, there is need of energy and it has grown considerably in the recent years, mainly due to the volume of systems and computing that companies now greatly rely upon. Consumption of this computing power of companies has attained a significant point. For example, an online business with 100,000 servers can simply expend up to $20 million a year on server power. For a/c cooling to add another $10 and it tops $30 million a year in power alone. Obviously there is a enormous potential for savings in their infrastructure. Even with the huge flow in computing power demands, there are many accessible technologies and methods by which imperative savings can be made. This series is enthusiastic to the ways a distinctive organization can reduce their energy consumption while maintaining required levels of computing performance.

Origin

The U.S. Environmental Protection Agency launched Energy Star in 1992, a voluntary label in program that is planned to promote and provide energy-efficiency in monitors, climate control equipment, and other technologies. This resulted in the extensive acceptance of sleep mode among consumer electronics. Concurrently, for promoting the low magnetic and electrical discharge from Cathode Ray Tube (CRT) based computer displays the Swedish organization TCO Development launched the TCO Certification program; this program was later expanded to take in criteria on energy consumption, design, and the use of hazardous materials in construction.

At Present

Now, for world's energy consumption the ICT industry is responsible for 3.1% for that. With the rate of consumption growing by 20% a year, when the world's energy consumption will double then it will be the 2030 year because of the ICT industry. During designing and implementing green computing technologies organizations use the Green Computing Life process. The primary stages in this includes Plan of action, Design, Implementation, Operations and Continual Improvements. Many government agencies have continued to adhere standards and regulations that encourage green computing. The Energy Star agenda was revised in October 2006 along with stricter efficiency necessities for computer equipment, along with a tiered ranking system for approved products. The 5 core green computing technologies advocated by GCI are Green Data Centre, Virtualization, Cloud Computing, Power Upsurge and Grid Computing.



There are currently many nations that have well-known state-wide recycling programs for outdated computers and consumer electronics tools The statutes either impose a fee for each unit sold at retail (Advance Recovery Fee model), or require the manufacturers to reuse the equipment at disposal (Manufacturer Responsibility model).

LATEST IMPLEMENTATIONS OF GREEN COMPUTING ARE:-

Blackle: Blackle is a search-engine site powered by Google Search. It based on the concept that when a computer screen is white it consumes 74W. When the screen is black it consumes only 59 W. For support of this theory if people changes from Google to Blackle, mother earth would save 750MW each year. This would be a good achievement of Green Computing. The principle that is based on the fact that the display of different colors use up different amounts of energy on computer monitors.Fit-PC is the size of a paperback and absolutely silent, yet fit enough to run Windows 7 or Unix. Fit-PC is designed to fit where a standard PC is too bulky, noisy and power hungry. Fit-PC consume only 5 Watts and less power than a traditional PC consumes in 1 hour.

Zonbu Computer: The Zonbu is a new invention and a very energy efficient PC. The Zonbu consumes just 1/3 of the power of a typical light bulb. The device runs the Windows/Linux operating system using a 1.2 GHz, VIA C7 ULV ultra low energy use processor and 512 MB of RAM. Without noisy fans and disk drives, it's completely silent, so it won't interfere in your space. And with no moving parts, Zonbu is rough. So, it can be packed inside our luggage without fear of damaging a fragile hard disk.

Sunray thin client: Like the Sun Ray this client consume less electricity than conventional desktops. Oracle says Sunrays are generally well suited for cost-sensitive environments such as desktop support, education, backup solutions, healthcare, service providers, and finance etc.

The Asus Eee PC : The "ultra-portable" class of personal computers which is indicated by its small size, fairly low power CPU, compact screen, low cost and innovations such as using flash memory for storage instead of hard disks. The Asus Eee PC is one example of an ultraportable. It has built-in Wi-Fi and it uses No plans Planning in next 2 year Already implemented 0% 20% 40% 60% 80% 100% flash memory instead of a hard drive. It runs Linux too.

FUTURE OF GREEN COMPUTING

Perhaps in the future, desktop computer manufacturers will be able to reuse or recycle every part of computers, leaving certainly zero waste but that’s a long way off. In the meantime, baby computers, like Enano and Zonbu, might just confirm as the best way to minimize the waste we produce in quest of ever more effective computing machines. There are daring ideas out there, too. One of the most interesting is the belief is that keystrokes, mouse scrolling, and the light from the screen could eventually produce all the necessary power a computer needs for operational Less fundamental ideas include the networking of several old computers into one processing unit that can be used by a large number of smaller devices. A company called N Computing is working on just such an arrangement for schools:

One old computer connects all of the memory and processing capability, and up to 30 students can connect to the host computer by way of a small device that consumes very less energy than a desktop computer (or even a laptop). Smaller gadgets which is built to depend on another system are called “thin clients.” Sun Microsystems is a big proponent of the

thin client system, which has some basic user interface utilities like email, chat, word processing, etc. and a very fast Internet connection for communicating with a central processing unit. Sun Microsystems is a big backer of the thin client system. Which is to say: Possibly the desktop computer of tomorrow won't be a computer at all. But in case the personal computer doesn't go out of style, many companies are analyzing with new assembling/production methods because we do not actually see it, most of us are not known that the production process is a very energy-intensive part of a computer's lifecycle. In 2004, a well-known company Texas Instruments drafted a greener circuit board fabrication plant that saved them so much money in water, power, and other manufacturing costs that it was more cost effective than outsourcing the project overseas, where the price of labour is much lower than in the U.S. If this kind of thinking is applied to every step of the desktop computer assembling process, coupled with a no-waste reuse program, we will make huge strides towards a future of viable technologies and completely green PCs.

STEPS TO GREEN COMPUTING

Five first steps you can take toward a green computing strategy.

1. Develop a maintainable green computing plan:

- To discuss with seniors about the elements that should be pertained into such a plan with organizational policies and checklists. These plans include recycling policies, disposal of used utensils, government directive principle and recommendations for buying green computer equipment.
- Green computing should cover power usage, reduction of paper utilization, as well as instructions for new apparatus and recycling old machines.

2. Recycle:

- Use of discard or unwanted electronic equipment in a convenient and environmentally responsible manner.
- Never discard computers in a landfill. Recycle them because they have toxin metals and pollutants that can emit harmful emissions into the environment

3. Make environmentally sound purchase decisions: Purchase Electronic Product Environmental Assessment Tool registered resources. EPEAT is a procuring tool promoted by the nonprofit Green Electronics Council to:

- Assist institutional purchasers estimate, compare and select desktop computers, notebooks and monitors based on environmental attributes.
- Provide a clear, reliable set of performance criteria for the design of products
- Know about the manufacturer efforts to minimize the environmental impact of products by reducing or eliminating environmentally susceptible resources, designing for durability and reducing packaging stuffs.

4. Reduce Paper Consumption:

- If you want to just read the e-mail, document, or Web page on screen then printing is not necessary.

5. Conserve energy:

- Switch off your system when you won't use it for an extended period of time. Turn on power management features during shorter periods of inactivity. Power management approach can save energy and help protect the environment .

CONCLUSION

The field of "green technology" encompasses a broad range of subjects from new energy generation techniques to the study of advanced materials to be used in our daily life. As part of the VIA Green Computing Initiative, VIA Carbon Free Computing is a natural extension of VIA's leadership in developing the most power efficient computing products on the market. As individuals and organizations around the world look to reduce their impact on the environment, a growing

concern is the reduction of one's Carbon Footprint which is a measure of the impact human activities have on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide.

The awareness programme may include the following major issues:

• Green computing minimizes the energy consumption of the organization i.e. minimizes the power bill.

• Use of non-toxic material in the equipment's make the worker safe from health problem and occupational hazards.

• It saves the resource of the country as a whole.

• In the long term this green equipment will be less costly without any hidden cost of waste and enhanced resource consumption without any detrimental effect of accuracy, performance and longevity.

REFERENCES

[1]. International Journal – Green Computing "Future of Computers"
[2]. http://en.wikipedia.org/wiki/Green_co mputing,
[3]. The Architectural Journal- Green Computing
[4]. N news – Green Computing
[5]. Green Living Idea Website 515-558.