

Need for Eco-Friendly Architecture of Computing and Telecommunications Devices: Green Computing Perspective

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Abstract- Green computing, also called green technology is the present need for safe environment. Its major goals are to use computers related resources like - monitors, printer, storage devices, networking and communication systems - efficiently and effectively with minimal or no impact on the environment. There is need to study the effect of computing resources, e-waste and other hazardous element that are responsible for global warming and changing nature of climate. So that how we can go for the eco-friendly Information and communications Technology, which aim to reduce the emissions of the CO₂, CFC and N₂O gases. To be safe from all the hazardous and harmful effect on environment, in the present time use of eco-friendly computers and electronic products has to be adopted. Business industries, Government and Nonprofit organizations should learn and adopt the future of Green computing. In this paper I intend to review the state and art of e-waste and in addition examine the possible solutions for prospect research advice to make possible green Computing.

Index Terms—: Green computing, Energy Star, Kyoto Protocol, EPEAT, Green House, Global Warming, Environm.

I. INTRODUCTION

The area of "green computing" cover a broad scope for different subjects and field of research area— beginning new energy-generation tools to the adjustment of higher equipment and machines to be used in our everyday life. In 1992, the US environmental Protection Agency launched the program i.e. Energy Star plan for reduction of the energy. It is the voluntary label programme whose principle is to encourage and to create awareness for of energy efficiency [3]. Green Computing focuses on ecological effect of engineering and science processes and new technology caused increase population in Earth. It has engaged in the lead itself and the target to make available society's requirements in behaviour that do not damage the natural resources. This means creating completely biodegradable products, falling pollution, proposing substitute technologies in different areas, and making a centre of economic association in the region of technologies with the purpose of promoting the environment. A vital aim of study of this research paper is to decrease the E-waste, Energy consumption rate and saving the paper cost and save the life of trees plants and also suggestions on using substitute non-hazardous equipment in the products' modern development in computing and telecommunication and networking devices.

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II. WHAT IS GREEN COMPUTING?

Green computing is the study of area where we can use the computing resources efficiently and reduce the energy consumption rate of electronic devices and telecommunications industries. The modern IT system depends on the use of networks hardware devices and communications system efficiently and effectively within a minimal or zero impact on the environments [2]. That is the reason the most important inspiration behind this green approach is cost reduction and also at the same time there are high amount of money savings and recyclable resources of computers. Green computing is the learning and put into practice of well-organized and biodegradable computing resources, networking device and telecommunications. Green computing is a very up-and coming area of research nowadays, not only because of growing power outlay and possible savings, but as well as due to the impact on the environment. Green technology performs the extremely vital function in terms of computing [8].

III. WHY NEED GREEN COMPUTING?

Due the extensive use of non eco-friendly materials in ICT, adverse effects on the health are continuously observed. Diseases like cancer skin problems are common due to use of non eco-friendly materials in daily life. Global warming is also a major outcome which cause rise in sea level, natural disasters, poor air quality and other factors. A healthy pollution free environment is very necessary for existence of life on earth. So it is very important to use eco-friendly materials to save our environment and adopt Green Computing practices. Environmental impact and power consumption are becoming crucial architectural systemic quality metrics [7]. Nowadays appliances of computer assets and networking devices are increasing the consumption rate of energy and also adversely affecting the environment. The major Obstacle in the way atmosphere today is Global warming, whose source are by carbon emissions. That adds up to decreasing the greenhouse gases emission and man-made CO₂ emission because those gases are responsible. Nowadays we are using a lot of electronics device to consume more and more energy. The present work is actually how to reduce the consumption of energy and paper to reduce the cost and saving more and more energy to save the environment. Figure [1] shows that how can we save environments using the green computing, which is more beneficial to reduce the energy consumption.



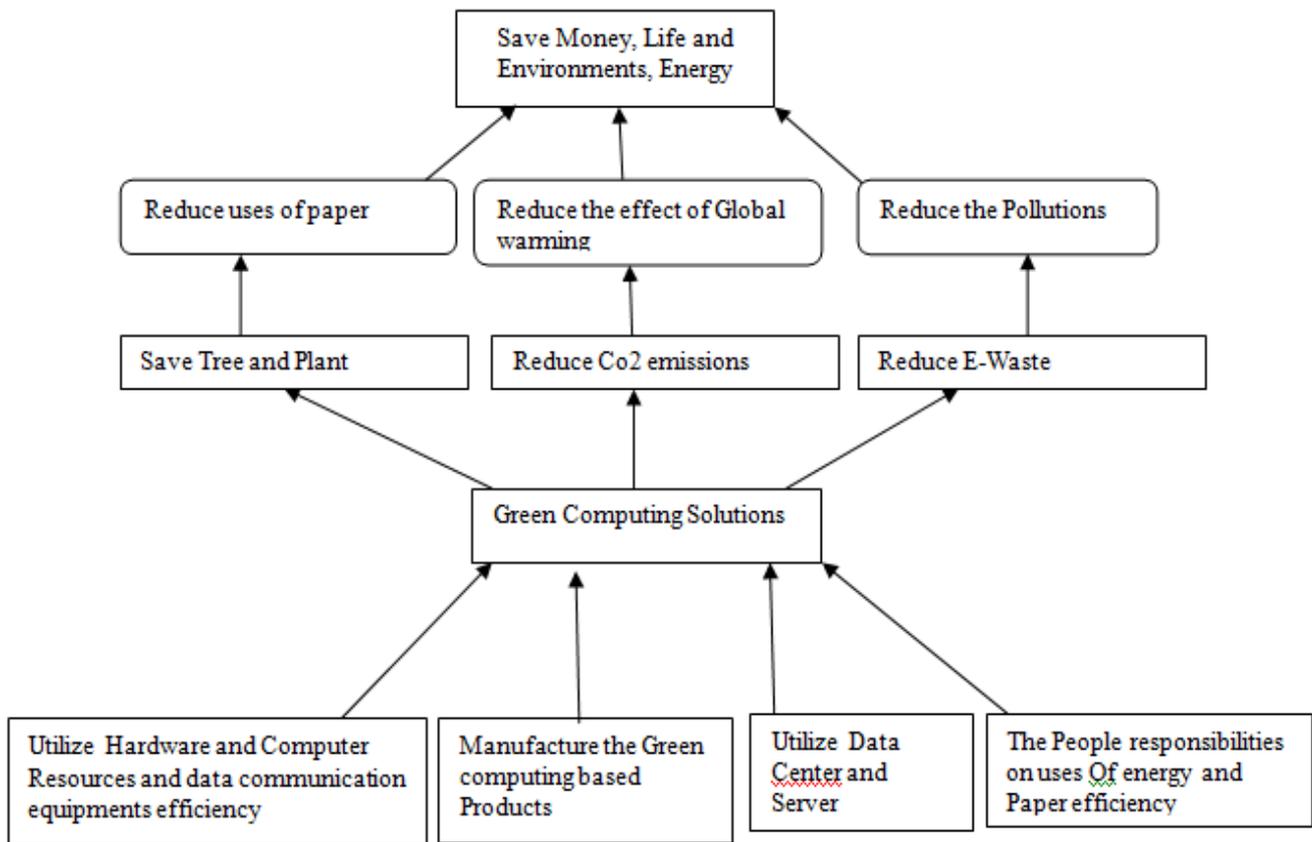


Figure 1:- Scenario of Green Computing

Scenario of Green computing [in fig 1] is explored as following:

IV. HOW TO SAVE ENERGY

There are some ideas that are come to our mind while currently working in the field of green computing and to save the energy and deduct the rate of energy consumption. Shutdown on computer after completing your job and save energy. Setup in your computer in energy saving mode when the CPU and Monitors once other part of computer inactive mode. Purchasing in new equipment which are the energy efficient i.e. the CRT uses more power than LCD monitors, and LCD monitors uses more power than LED monitors which use the minimal power of current monitors here we can save the more energy compare to the old CRT monitor. But it is also required to the business industries to support the computer system usage green computing resources today almost every computer hardware manufacturers support the green technology. Purchase Electronic Product Environmental Assessment Tool registered products. EPEAT is a procurement tool promoted by the non-profits Green Electronics, Council to help institutional purchasers evaluate, compare and select desktop computers, note-books and Monitors based on environmental attributes [8].

V. E-WASTE

Here we also discuss the rules and regulations of India government for recycling the waste material, the chemical material and its effect on environments and life for very dangerous. Regulation on Recycling of Waste Materials, 1999, 2000 The waste materials targeted : waste oils, lead –

acid batteries, non-ferrous wastes The auction / sale of these materials to only authorised recyclers who are registered with the Ministry of Environment & Forests, Govt of India No trader can take such type of waste. Batteries (M & H) Rules, 2001 Responsibilities for Manufacturers, users auctioneers, dealers and importers of batteries Manufactures are to take initiatives to collect the spent batteries back Recyclers / re-processors of batteries need to register themselves with the MoEF Procedural Requirements to Operate an Industry. Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 1994, 2000 Identify whether the chemicals handled, used and stored or imported [6]. So we required make the computer resources and telecommunications parts recyclable. Because the recyclable parts of computer and telecommunication are more suitable for environments and life. We can also recycle the useless device or electronics equipment in a convenient environmental friendly responsible manner. Because the computers component have pollutant metal that can generate the high amount of harmful emissions into environments. We should rather recycle them as the manufacturers never dispose captures computers in a landfill. Recycle them instead through manufacturer programs such as HP's Planet Partners recycling service or recycling facilities in your community or we can donate still-working computers to a non-profit agency [2].



VI. GREEN COMPUTING REDUCES THE GREEN HOUSE EFFECT

In our daily we use a lot of computer and telecommunications works. A lot of power requirement is needed for computer and telecommunication work in a day. In this power is produced by the burning of huge amount of coals, woods and other material, chemical which produce a lot of gases. The High amount of gases produce is the main reason for rise in temperature of Earth— Carbon dioxide, methane, nitrous oxide, and fluorocarbons. It is Harmfulness of both life and environments. Researchers work continuously into making the use of computer resources as energy-efficient as possible and designing the tools and system for the efficiency-related computer resources and telecommunications with the help of Government organisation, non profit organisation and business industries.

VII. GREEN COMPUTING IS DEVELOPING GOOD ENVIRONMENTAL PRACTICES

“The Kyoto Protocol is based on the principle of Green Computing. It is a worldwide treaty which extends in 1992 United Nation Framework Convention on Climate Change (UNFCCC). There are different countries members in the, Kyoto Protocol”. The Kyoto Protocol implemented the objective of the UNFCCC to fight global warming by reducing greenhouse gas concentrations in the atmosphere to "a level that would prevent dangerous anthropogenic interference with the climate system". The Protocol is based on the principle of common but differentiated responsibilities: it puts the obligation to reduce current emissions on developed countries on the basis that they are historically responsible for the current levels of greenhouse gases in the atmosphere [5]. The Organization for Economic Co-operation and Development (OECD) has published a survey of over 90 government and industry initiatives on "Green ICTs", i.e. Information and communication technologies, the environment and climate change [4]. With the help of green computing we are able to reduce energy consumption of computing resources during peak process, save energy for the period of inactive operation, use biodegradable sources of power, reduce dangerous effects of computing resources and also we can reduce the computing wastes. Manufacturing the computer peripherals such as hardware designer, operating system designer data centre and client side and business industries based on green computer is the major issue in the development of green computing. Green Computing is representation of primary profitable as well as ecological. Moving innovative efforts in the major area of computer resources energy consumption—are earning a set on the commercial plan, and accomplishment of these programs is clearly within the turn up of a large amount of project today.

VIII. CONCLUSION AND FUTURE WORKS

Outcome of green computing are reducing the use of harmfulness resources and minimize the use of energy. Green computing is the issue to represent and study the global warming, by adopting the green computing based computer resources we can minimize the consumption rate of the energy and save ourselves from harmfulness effects of

the environments while also reducing e-waste and paper cost. So we should look forward to the eco-friendly architecture of computing and telecommunication devices. Finally it is concluded that the use of green computing is beneficial in reducing energy consumption, health problems and saving our environment in economical and ecological way. In future, more research is necessary to further reduce the energy consumption through using the green computing based systems and develop new techniques for energy improvement efficiency.

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