Green Computing

Green computing or **green IT**, refers to environmentally sustainable computing or IT. Green computing is "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."

The goals of green computing are similar to green chemistry; reduce the use of hazardous materials, maximize energy efficiency during the product's lifetime, and promote the recyclability or biodegradability of defunct products and factory waste. Research continues into key areas such as making the use of computers as energy-efficient as possible, and designing algorithms and systems for efficiency-related computer technologies.

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 peripherals as well as reduced resource consumption and proper disposal of electronic waste (e-waste).

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. Similar programs have been adopted in Europe and Asia.

Government regulation, however well-intentioned, is only part of an overall green computing philosophy. The work habits of computer users and businesses can be modified to minimize adverse impact on the global environment. Here are some steps that can be taken:

- Power-down the CPU and all peripherals during extended periods of inactivity.

- Try to do computer-related tasks during contiguous, intensive blocks of time, leaving hardware off at other times.
- Power-up and power-down energy-intensive peripherals such as laser printers according to need.
- Use liquid-crystal-display (LCD) monitors rather than cathode-ray-tube (CRT) monitors.
- Use notebook computers rather than desktop computers whenever possible.
- Use the power-management features to turn off hard drives and displays after several minutes of inactivity.
- Minimize the use of paper and properly recycle waste paper.
- Dispose of e-waste according to federal, state and local regulations.
- Employ alternative energy sources for computing workstations, servers, networks and data centers.

A Brief History of Green Computing

One of the first manifestations of the green computing movement was the launch of the Energy Star program back in 1992. 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, virtualization practices, eWaste, etc.

Green Computing Groups

Currently, one of the popular green computing groups is tactical incrementalists. This group applies and uses green computing philosophies mainly to save up on costs rather

than save the environment. This green computing concept emerged naturally as businesses find themselves under pressure to maximize resources in order to compete effectively in the market. This movement arose mainly from economic sentiments rather than political pressure.

Strategic Leaders take into account the social and environmental impacts of new and emerging technologies. Aside from minimizing costs, this particular movement also takes into account other factors such as marketing and branding. Unlike the position held by tactical incrementalists, strategic leaders recognize the need to overhaul some existing policies or structural makeup of the organization. This can be seen in recent efforts to make IT personnel directly responsible for managing, minimizing and ensuring efficient energy expenditures.

Green Computing Practices

Some common green computing practices include turning off the monitor when it's not in use or using more energy efficient monitors like LCDs instead of the traditional CRT monitors, volunteer computing or file sharing practices, virtualization of servers, using more energy efficient and less noisy cooling systems (like using liquid cooling systems instead of the conventional heat sinks and fans), temperature maintenance and regulation to reduce thermal shock wear and tear to computer parts, and increased online security measures through the use of firewalls, anti spyware and anti virus programs to reduce the increasing amount of eWaste on the Internet and on other networks.