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An Empirical Study on Ncomputing as an Architecture That Changes the Green Equation.

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Abstract
As we know very well that in present days, computer is the basic need of every common man and they have to use it for time saving and to minimize human labour, rather than they also need to aware about its harmful impacts on the environment. In this research paper we take various factors related to the awareness of green computing. Present desktop computers gives extremely powerful performance since they are equipped with blazing 2 GHz dual-core or core to duo processors and high-performance memory. However, mostly users rarely need the capacity of operation more than 5 percent of available computing capacity – the rest is wasted. It would be possible to achieve significant environment and cost savings by sharing this excess or waste power by many users simultaneously. NComputing seized on this idea by which minimize the power consumption. Power consumption by the computers is the major issue in current industries and data centres.
Keywords : N-Computing ; Application of N-Computing ;Green Computing.

I. Introduction

Green computing is a new technology whose goal is to design better computer system means their processing is better with the consuming less amount of energy. Use of computer system and IT services makes life easier and work faster, it increase resulting of greater power consumption, which results increase in emission of green house gas like CO2. Many studies already show that power cost has a more percentage of the total management cost of data centre.[1] Since the computer system consume power and its peripherals also consume power even when these are not in use. Data centres as well as communication centres needed a lot of power and cooling system to operate, if the required power and cooling capacities are not enough then it will result in loss of energy. Study shows that most of data centres don't have sufficient cooling capacity this is the cause of environmental pollution.

In recent years, companies in the computer sector have come to realize that going green is in their best interest, both in terms of reduced and costs public relations. In 1992, the U.S. Environmental Protection Agency launched Energy Star, a voluntary labelling program that is designed to promote and recognize energy-efficiency in climate control equipment, monitors and other technologies. This resulted in the widespread adoption of sleep mode among consumer electronics.[2,3]

Green computing is deals with concepts minimize the energy consumption, recycling eliminate harmful elements but it also deals with reduce in the business travel sharing the resources (cloud computing) and optimization. There are a lot of fundamental steps that can be taken to significantly decrease the power consumption and impact on environment. Main objectives of using Green computing are :

- Reduction in energy consumption.
- Reducing equipment disposal requirements.
- Minimizing the paper and other consumables used.
- Reducing travel requirements for employees/customers.

The prime goal of green computing is to reduce the use of hazardous material and save our environment from its harmful impacts. Although computer is the basic need of every common man and they have to use it for time saving and to minimize human labour, but they also need to aware about its harmful impacts on the environment. Carbon di-oxide emission also plays a big role to affect our environment and most of CO2 emission is produced through the use of computer and its devices.[4] This approach towards N-Computing helps to check the every common man's knowledge about green

computing ,cloud computing and initiatives towards green computing taken through computer manufacturers and also taken by a common man.

N-Computing. Sometimes, especially if there are a lot of people using the computers in the same area, the computers seem to barely work at all, or only very slowly. The desktop(s) can also be confusing or seem glitchy or otherwise messed up on occasion, most frequently in relation to the permanent window in the center of the desktop. Many companies and data centers faces such type of problems, which also reduces the life of these computers. NComputing followed by green computing is the rising technique to resolve such problems. NComputing systems are a major leap forward in green computing. Thousands of organizations in many countries have used NComputing to slash their carbon footprint and reduction in electric consumption. The NComputing solution is based on a simple fact: today's PCs are so powerful that the vast majority of applications only use a small fraction of the computer's capacity. NComputing's virtualization software and hardware tap this unused capacity so that it can be simultaneously shared by multiple users.[5] NComputing is a desktop virtualization company that manufactures hardware and software to create virtual desktops (sometimes called zero clients) which allows multiple users to simultaneously share a single operating system instance. The NComputing virtualization software works on a standard Windows or Linux1 PC. In such systems, each monitor, mouse and keyboard of user connect to the shared PC through a durable and small NComputing access device. The system itself has no CPU, memory, or moving parts—so it is easy to deploy and maintain. It also consumes very small power.

II. Operating system support.

Linux support

Linux is supported through a version of vSpace Server for Linux software. Currently, The vSpace Server software and hardware clients require registration after 30 days for product upgrade notification.[6] This software is proprietary and is not require regular maintenance . The last update was made in last month of 2012.

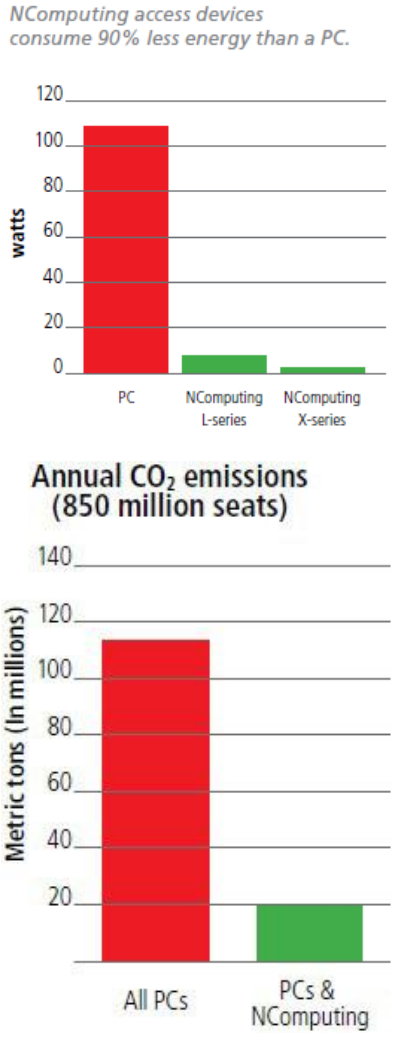
Windows support

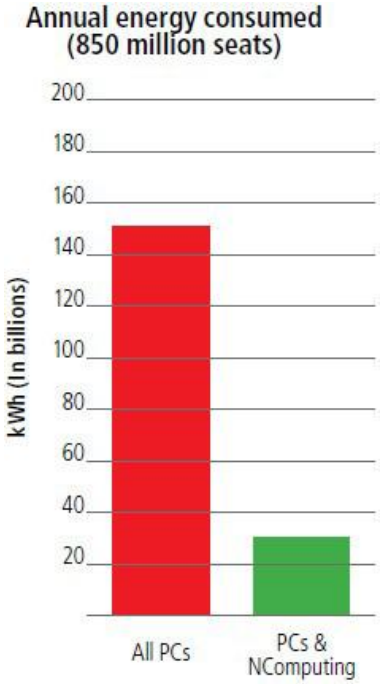
Windows is supported with the help of a version of vSpace Server for Windows software. The supported versions of Windows include: Windows Server 2003 R2 SP2, Windows XP SP3 (32-bit); Windows Server 2008 SP2, Windows Vista SP21(32-bit); Windows Server 2008 R2 SP1, Windows Multi Point Server 2011, Windows 7 SP1 (both 32- and 64-bit). The vSpace Server software and hardware clients require registration after 30 days for product upgrade notification.[6]

III. Why we use NComputing?

Consumes less energy per user.

Normal PCs generally consume between 110 to 200 watts of electricity. In contrast, NComputing access devices consume next to nothing. In fact, NComputing's L-series devices consume 5 watts per added user and the X-series consume just 1 watt per added user. If we replace seventy PCs with ten PCs attached to sixty NComputing X-series access devices, we would save over 9,000 kilowatt-hours (kWh), which translates to over 1 metric ton of CO2 emissions per year.[7] The given graphs shows the comparison between normal PCs and NComputing systems on account of energy saving and carbon di-oxide emissions.





Air conditioning—the environmental cost

A single Personal Computer generates more heat than a 100 watt light bulb. A classroom, computer lab, or office with PCs got heated up very quickly. Hence it is required to remove such heat from the working space. In fact, PC-filled work areas almost always have to be air conditioned. Air conditioners raise electricity costs and require large capital expenditures to install, and maintain them. In comparison, a room equipped with PCs and NComputing access devices requires less electric power for running hence generates 90% less heat and does not require additional air conditioning.

Less e-waste in landfills.

From many surveys, it is found that while electronic waste represents only 20% of trash in landfills which is non-toxic, it represents 80% of the toxic waste. NComputing greatly reduces the magnitude of this problem and make environment eco friendly. [8]

• Generally, PCs generate much more waste than virtual desktops. For example a normal PC weighs about 21 pounds (9.5 kg); an NComputing access device weighs about 1/3 of a pound (0.15 kg), which ensure 98% reduction in electronic waste.

• An NComputing access device also has a much longer useful life as compare to a normal PC. When a shared PC is replaced with a newer one, the PC may go to a landfill, but the NComputing users can keep their access devices and enjoy the boost in performance from the new PC. With less frequent turnover, less equipment ends up in landfills.

Other guidelines for energy saving.

Although the green computing and NComputing are the suitable ways to minimize the energy consumption in various industries as well as data centers, rather than this some important guidelines should keep in mind while using computers.[9] These are:

1. Whenever the PC is not using more than 20 minutes we should turn off the monitor. On the same way turn off the PC and monitor if not going to use the PC for more than 2 hours.
2. Completely switch off all computer equipment and related devices at night, or have planned long absence from computer work.
3. Enable power management features in operating system to force the computers to go into "sleep" or hibernate or standby mode after a predetermined time interval of no activities.
4. Whenever buying new equipment for replacement, we should look for equipment items bearing an energy saving label.
5. Use flat-screen monitors, not only the flat-screen monitors consume less power energy, they are also more user friendly and less fatigue to your eyes.

Future of Green Computing.

The growth towards green Information Technology should include new electronic products and services with maximum efficiency and all possible options towards energy savings. That is Organization or companies are laying emphasis on moving towards Eco Friendly Components in Computers, **the use of eco-friendly components will become the norm rather than the exception in future.** In addition to its impact on the carbon footprint or CO2 emission, NComputing also reduces e-waste. Its small access devices weigh just 0.20 kg – significantly lighter than approx 10 kg of traditional PCs. The global impact of leveraging NComputing would mean 6.3 million metric tons of e-waste could be reduced. Another striking advantage is that NComputing access devices need no upgrades."Whenever there is need for a PC upgrade, only the shared PC has to be changed. This significantly reduces maintenance costs." **[10]**

IV. Conclusion

As the computer is the basic requirement of current life, the study will tells the approaches of green computing from normal PCs. Along with the fact that how the power consumption is reduced through different approaches and key challenges facing to accomplish the goal. Above discussion shows that Green computing along with N-Computing, recycling and desktop virtualization can

enable more energy efficient use of computing power.

The NComputing virtualization solution deals with both hardware and software and uses a shared PC as the fountainhead of processing power for seven to 35 virtual desktops. The power consumed in processor is virtualized and shared through a small NComputing access device to which each user's peripheral components are connected. In future, many companies are planning to penetrate more markets and develop solutions for improvements in televisions and set top boxes to enable "cloud-based" computing at a fraction of the financial and environmental cost of traditional desktop PCs.

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