Virtualization and Green Computing

"Green computing" seems to be the up and coming thing for suppliers offering virtualization software as well as management software for virtualized environments.

What is "green computing" you ask? It appears that there are many related, but different, definitions floating around the Internet. Most of them focus on a set of processes and approaches designed to make datacenters more efficient. This means reducing the power and cooling required. The **daily** power consumption of a typical datacenter is equivalent to the **monthly** power consumption of thousands of homes. How many homes typically depends upon the size of the data center, and the number of systems in the data center. This has become a large enough topic that the U.S. Environmental Protection Agency has started a study of datacenter power consumption.

What does this have to do with virtualization?

As it turns out, it has a great deal to do with the subject. One of the primary goals of almost all forms of virtualization is making the most efficient use of available system resources.

Storage virtualization uses hardware and software to break the link between an application, application component, system service or whole stack of software and the storage subsystem. This allows the storage to be located just about anywhere, on just about any type of device, replicated for performance reasons, replicated for reliability reasons or for any combination of the above.

- **Consolidation** — In the past, it was necessary for each computer system to have its own storage to function. Storage virtualization makes it possible for systems to access a shared storage subsystem that is somewhere out on the net. It also means that copies of data that used to be stored on every computer's disks can now be stored once in the shared storage subsystem. It's clear that this approach would reduce the number of storage devices needed, the amount of power required, the heat produced and, as a wonderful side effect, would reduce the operational and administrative costs of back up, archival storage and the like.
- **Appropriate devices** — since the link between the application and the actual storage device is broken by storage virtualization software, the device can be selected based upon what's most appropriate. Applications and data that are accessed frequently can be stored on high speed, expensive devices that consume more power. Applications and data that are accessed less frequently can be stored on lower speed, less expensive devices that consume less power. Rarely accessed applications and data can be migrated to archival storage devices that result in the lowest cost and require the lowest power consumption.

Properly utilized, this approach can help organizations reduce hardware, maintenance and administrative costs while also helping preserve the endangered kilowatt and preventing the release of the dreaded BTU, Calorie or Joule.