WHITEPAPER

Save Green and Go Green With Thin Clients

BOSaNOVA

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During these tough economic times, companies are looking for ways to save. This and the corporate push for greener technology have influenced the surge in thin client deployment. This whitepaper explains further how cost savings can be found by replacing PCs with thin clients and how this technology helps companies go green.

The Skinny on Thin Clients

For those who are not familiar with thin client technology, here's a quick overview. Wikipedia's definitions of a thin client is:

A **thin client** (sometimes also called a **lean** or **slim client**) is a client computer or client software in client-server architecture networks which depends primarily on the central server for processing activities, and mainly focuses on conveying input and output between the user and the remote server. In contrast, a thick or fat client does as much processing as possible and passes only data for communications and storage to the server.

Consultants have been saying for a long time that thin clients are the future. Today, thin client technology finally has caught up with the vision. A few years ago, most companies had two or three models of thin clients, but today there are many models to choose from with varying CPU speeds, memory capacities, storage capacities, and operating systems. Besides being more secure and easier to deploy, manage, and maintain (than their PC counterparts) thin clients boast a longer life expectancy because they have no moving parts, small footprint on the desktop, lower power consumption, and server-centralized data storage.

Environmentally Friendly Technology

To reduce the environmental impact of technology, many companies have moved from PCs to energy efficient thin clients. There are a number of reasons why thin clients have green advantages over PCs including lower energy consumption, centralized management, more efficient use of resources, and more.

Lower Energy Consumption: Research has found that PCs use twice as much energy as a thin client environment. PCs average between 65 – 250 watts of energy whereas thin clients require only about 40 watts including the server. Some thin client models require less than 7 watts of energy for the hardware. "Using an estimate of 22.9 million business desktop PCs in operation around the U.S., businesses could be saving a total of about $354.7 million a year and cutting CO2 emission by about 2.45 billion pounds." (Thin Clients Save Energy, Spare CO2 - eWeek)

Longer Life Span: Thin clients last approximately 4-6 years longer than their PC counterparts resulting in less wasted hardware. Computer hardware is damaging to the environment. Thin clients lessen the burden on our environment because they last longer, are smaller and can be recycled.

Centralized Management: Thin clients can be managed from one central location, therefore maintenance can be performed on remote desktops without having to be at the user's physical location.

More Efficient Use of Resources: Thin clients only use the exact amount of resources required by the current task whereas a PC is setup to copy with the maximum load that the user needs.

RoHS Compliant: BOSaNOVA Thin Clients meet the RoHS regulation regarding the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Go Green with Virtualization

Research has indicated that for one virtualized server, companies can save about 7,000 kilowatt hours (kWh), or four tons of CO2 emissions, every year.

Let's Talk Cost Savings

Savings can be found as the result of reduced energy consumption, lower cost of ownership, centralized management, longer life span, and more. You'll notice that the same reasons that make thin clients environmentally friendly also make them financially friendly.

Let's breakdown the cost savings you'll find from the reduction of energy by implementing thin clients. Below is a chart showing the energy rates per state.

Average Revenue per Kilowatthour by State

(Lowest to Highest Rate as of July 2008)

Rank	State	Average Electricity Rate forAll Sectors(Cents per Kilowatthour)
1	West Virginia	5.66
2	Idaho	5.91
3	Wyoming	5.91
4	Washington	6.56
5	Kentucky	6.89
6	North Dakota	6.91
7	Oregon	6.99
8	**Nebraska**	7.16
9	Utah	7.16
10	South Dakota	7.34

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Average Revenue per Kilowatthour by State

(Continued...)

11	Indiana	7.37
12	Iowa	7.95
13	Missouri	7.99
14	Montana	8.12
15	Tennessee	8.19
16	South Carolina	8.34
17	Arkansas	8.55
18	North Carolina	8.58
19	Minnesota	8.69
20	Ohio	8.90
21	Virginia	8.91
22	Kansas	8.93
23	New Mexico	9.16
24	Illinois	9.17
25	Oklahoma	9.39
26	Alabama	9.41
27	Wisconsin	9.46
28	Colorado	9.55
29	Pennsylvania	9.85
30	Mississippi	9.89
31	Arizona	9.99
32	Georgia	9.99
33	Michigan	9.99
34	Louisiana	10.52
	National Average	10.68
35	Florida	10.86
36	Nevada	10.88
37	Texas	12.25
38	Vermont	12.38
39	Delaware	13.00
40	Maryland	14.02
41	Maine	14.05
42	California	14.07
43	District of Columbia	14.22
44	New Hampshire	15.11
45	Alaska	15.38
46	Rhode Island	16.98
47	Massachusetts	17.05
48	New Jersey	17.26
49	Connecticut	17.34
50	New York	18.81
51	Hawaii	31.56

Source: *Electric Power Monthly.* Energy Information Administration, Washington, DC. Nebraska Energy Office, Lincoln, NE.

The national Average Electricity Rate per kilowatthour is 10.68. If you have 100 PCs and you run them for 40 hours a week, 52 weeks a year, the estimated cost for energy to run your PCs is approximately $1444. The cost to run thin clients within the same scenario is $155.50. This results in a total cost of savings of $1288.50 a year.

Below is the calculation in detail:

Number of devices x electricity rate x 40 hours a week x 52 weeks x .007 (for thin clients)
Number of devices x electricity rate x 40 hours a week x 52 weeks x .065 (for PCs)

For total estimated savings, simply subtract the total amount for PCs from the thin client calculation.

Check out an Energy Cost Savings Calculator to calculate how much you can save.
http://www.bosanova.net/energy-savings-calculator.htm

Thin Clients are less expensive as PCs and because they have no moving parts they last significantly longer, resulting in an even larger cost saving. Since they are managed centrally, IT staff can be utilized for more pressing projects. They are also much smaller in size, requiring less cost for shipping.

BOSaNOVA thin clients are designed to meet EPEAT and Energy Star environmental standards. The RBT Series thin clients require only 7 watts.

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Save Even More with Desktop Virtualization

Desktop virtualization is quickly gaining traction. It's no wonder given the high cost of maintaining PCs and the popularity of client-server technology. Costs can vary, but one study by a leading industry research group states that the total cost of ownership for a desktop PC is about $5,400 per PC, per year. This figure actually increases as the PC depreciates. Because of the rise in the cost of managing and securing PCs, many companies have searched for alternatives. This often leads them to desktop virtualization and lower-cost hardware options like thin clients.

Desktop virtualization is defined as a computing environment in which some or all components of the system, including operating system and applications, reside in a protected environment, isolated from the underlying hardware and software platforms. The virtualization layer controls interactions between the virtual environment and the rest of the system. Essentially, servers host desktop environments specific to each user and stream applications and operating systems to the desktop.

As indicated in the Report to Congress on Server and Data Center Energy Efficiency - Public Law 109-43, it is estimated that nation's servers and data centers consumed about 61 billion kilowatt-hours (kWh) of energy in 2006 (1.5 percent of total U.S. electricity consumption) for a total electricity cost of about $4.5 billion. This estimated level of electricity consumption is more than the electricity consumed by the nation's color televisions and similar to the amount of electricity consumed by approximately 5.8 million average U.S. households (or about five percent of the total U.S. housing stock). Federal servers and datacenters alone account for approximately 6 billion kWh (10 percent) of this electricity use, for a total electricity cost of about $450 million annually.[1]

Research has indicated that for one virtualized server, companies can save about 7,000 kilowatt hours (kWh), or four tons of CO2 emissions, every year. That of course results in a significant savings on energy. Another environmental benefit is that a reduction in servers also means a reduction in electronic waste.

Not Just About Green

Benefits of thin clients go beyond saving money and protecting the environment. Other benefits include increased security, easier management and installation, a wide-range of hardware options including tablets and wireless units, and small footprint for environments where space is a premium.

It's no secret that companies need to save money wherever possible and help reduce the energy used by our growing data centers. With thin clients and/or virtualizations companies can do just that.

[1] Report to Congress on Server and Data Center Energy Efficiency - Public Law 109-43

About BOSaNOVA, Inc.

BOSaNOVA, Inc. is principally engaged in the design and development of thin clients and network appliances. BOSaNOVA Thin Clients and virtualization work hand-in-hand to provide many benefits including low energy consumption, easier management, and improved total cost of ownership. BOSaNOVA's award winning thin clients are Citrix and VMware certified and available in a wide-range of hardware options including traditional logic units, All-in-Ones, and Wireless Tablets and a choice between CE.Net, Linux, and XP Embedded. BOSaNOVA is able to quickly provide customized thin client solutions to meet customer's exact requirements. Visit us online at www.bosanova.net.

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