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SOLUTION NOTE

THE EVOLUTION OF THE GREEN DATA CENTER

Xsigo I/O virtualization lowers data center costs and reduces environmental impact

THE CHALLENGE

Organizations today are faced with an ever-increasing array of business requirements that mandate unprecedented changes to the IT environment. CIO's are faced with pressure to 'green' their data centers from both a PR perspective and for cost savings. While green data centers make for good press, their true value comes from being able to reuse existing floor space, and power and cooling capabilities while building out the next generation data center. Investing in additional power and cooling is expensive and difficult to do in a production building without compromising uptime.

GREENING THE DATA CENTER

The easiest and most cost effective 'greening' process is to re-architect the compute infrastructure, from the servers to the storage and networking. Replacing old legacy servers with dense form factor, energy efficient servers, and the elimination and consolidation of switching and storage infrastructure, will provide fast, effective cost and power reductions, and increase capacity.

According to the EPA, servers consumed 80% of the total IT load and 40% of total data center power consumption in 2006. Even while sitting idle, these servers use nearly as much power as they do when they are active.

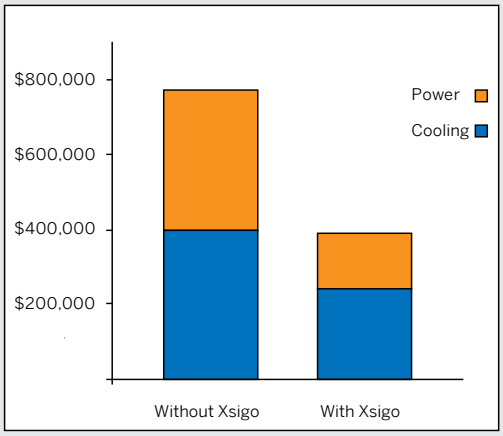
SERVER VIRTUALIZATION HELPS

Server virtualization allows the consolidation of multiple servers to a single platform, taking advantage of the unused resources. Simply consolidating 5 to 10 servers to a single platform can reduce server power consumption by 50% to 75%.

However, server virtualization increases the switching infrastructure requirements, due to the increased I/O requirements (additional backup, management, storage and VMotion connections), which reduces the overall opportunity for costs savings.

GREEEN DATA CENTER BENEFITS

- Lower power consumption
- Less hardware installed - less rack- and floor-space needed
- Physical connections reduced by 70%
- Lower cooling requirements



Power and cooling cost over 5 years, assuming $0.10/kWhr in a 500 server data center

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SOLUTION NOTE

Xsigo I/O virtualization lowers data center costs and reduces environmental impact

Deploying the Xsigo I/O Director has the environmental impact equivalent of taking 425 cars off the road.

The Xsigo VP780 I/O Director consolidates server I/O by replacing a server's multiple Ethernet and Fibre Channel interfaces with a single high-speed low-latency 20 Gb/s link.

REDUCED SWITCHING HARDWARE

The Xsigo VP780 I/O Director takes the green aspects of the virtualization data center several steps further, allowing the data center architect to eliminate a significant portion of the top-of-rack switching infrastructure, including both Ethernet and Fibre Channel switches.

I/O POWER SAVINGS

In a data center with 500 Fibre Channel-attached servers, the FC switch is over subscribed by 24:1 (24 HBA connections to the FC switch per disk connection). Because the VP780 can provide virtual HBAs to the server, it does not require two FC switch ports per server. Instead, it matches the disk connections one-for-one, and then provides two vHBAs to every server - a reduction of 960 FC switch ports, saving not only the cost of the physical devices but also realizing a savings of 6.4W of power per port - or almost 54,000 kWh over a year.

For Ethernet switches, the VP780 can connect directly to the core switching infrastructure utilizing 10GbE I/O cards, eliminating 42 top-of-rack switches in our 500 server data center. Assuming Cisco 4948's at 300W per switch, that saves over 110,000 kWh in a single year.

REDUCED SERVER POWER

By reducing the physical I/O requirements (NICs and HBAs), the Xsigo solution allows the data center architect to move from a 4U server to a 1U server without sacrificing CPU or memory capability. The server size reduction allows rack footprint to shrink by 75%. Using the same 500 server data center example, 4U servers using 800 watts per server compared to a 1U server that using only 300 watts, saves almost 2.2 million kWh over the course of a year. With the denser server profile and decreases in the top-of-rack and end-of-row switching, a 500 server data center can realize up to an 80% reduction in physical space required for the same computing capacity.

The Xsigo data center solution allows the DC manager to save over $225k per year in power and more than $1,000,000 over the course of 5 years.

LESS COOLING REQUIRED

By reducing the data center infrastructure and enabling a move to a smaller, denser server form factor, the BTU output goes down considerably, providing additional cost savings on cooling. It represents a savings of $156K per year and $783K over 5 years. Combined with the power savings, this is $384,000 per year, an almost $2 million cost reduction over 5 years.

LOWER COST AND BETTER FOR THE ENVIRONMENT

The energy reductions using Xsigo virtualized I/O in our 500-server data center have a carbon emmisions equivalent of taking 425 cars off the road. Xsigo delivers the means to significantly reduce energy costs while reducing the impact on the environment – a great opportunity for IT managers to positively impact the bottom line and to feel good about doing it! ■

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