



Software Association
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FIRST ANNUAL BRAIN PARTY

November 29, 2007

More than just a networking event. Music, food and main stage activities including the Dating Game – Geek Edition!

Clean Tech Forum: Sustainability through Technology

Linda Barney, Barney & Associates

The Clean Technology Forum held its first session with a panel discussion on the topic "Virtualization: Efficiency with Data Management" that was presented in three cities. The road trip event started in Portland, and then moved to The Dalles and Bend. The moderator of the event was Todd Bauman, Stoel Rives and panelists included Rich Bader, EasyStreet Online Services CEO; William (Al) Thomason, IBM system storage portfolio manager; Thor Hinckley PGE Renewable Power program manager; and Jake Smith, Intel advanced server technologies marketing. Members of the panel rode the BioTrekker biodiesel bus between event stops.



The Clean Technology Forum is sponsored by the Software Association of Oregon and will be steered by a team of experts in sustainability and technology. During the introduction to the session, Todd Bauman, Stoel Rives and Harvey Matthews, president of the SAO, described the serious trend in the Northwest toward cleaner, greener business operations. "It is important that professionals in the area know about the opportunities available so that they can see how to leverage technology to make the businesses they manage more efficient and sustainable. It's an exciting time, and we are excited to highlight companies that are making breakthroughs in the clean technology space. We want to develop a link between high technology, software and sustainability to extend Oregon's lead in sustainability and clean technology," said Matthews.

"The Clean Technology Forum will evangelize the opportunities available in clean technology and reward companies implementing such processes through recognition. By broadcasting opportunities and highlighting examples, we hope to see implementation of clean and sustainable business practices blossom through the utilization of advanced technology," said Bryce Yonker, SAO membership director and one founder of the Clean Technology Forum.

Todd Bauman, [Stoel Rives](#), indicated that Stoel Rives has a large practice relating to renewable energy with clients all over the world. "Recently, we are seeing an intersection of technology and energy. We are excited to sponsor and participate in the Clean Technology Forum and be involved in the intersection of energy, electricity and

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November 8, 2007
[Agile Roundtable: What Makes Agile Development Work?](#)
Quality Assurance SIG

November 15, 2007
[ITIL Executive Overview](#)
Oregon Training Network

November 20, 2007
[Trade-Shows Part II: You've Got Leads...Now What?](#)
Marketing and Sales SIG

November 28, 2007
[Agile Development](#)
Development SIG

November 28, 2007
[ITIL V3 Bridging](#)
Oregon Training Network

November 29, 2007
[Portland Brain Party](#)
Co-sponsored event

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technology”, said Bauman. Bauman asked the panelists to describe how their companies are using technology to reduce energy consumption and what that think can be done in the future to improve sustainability and increase energy efficiency.

Support for green energy and sustainability in Oregon

There is a growing cluster of wind, biofuel, solar, wave and geothermal energy companies (such as PPM, Sequential and Solaicx to name a few). There are advocacy and support groups such as Energy Trust, NW Renewable Project, Natural Step and the Green Grid. The electricity companies such as Portland General Electric, NW Natural Gas and PacifiCorp are heavily moving their marketing focus to renewables. Law firms including Stoel Rives, Ater Wynne and Lane Powell, developers such as Gerding Edlen, and engineering companies such as Ch2M Hill are centering their business models around the importance of sustainability. Tech companies large and small such as Intel, IBM, EasyStreet and HP are passing green product offerings to their customers. Then there are the lesser-known tech solutions, such as software that helps you print less paper or that monitors your energy consumption or waste.

PGE – improving sustainability by providing renewable energy

Thor Hinckley, manager of the [Renewable Power program at Portland General Electric](#) (PGE) indicated he is excited to be involved in the Clean Tech Forum and have the chance to work with software and hardware developers and various industries in moving into energy sustainability. Hinckley stated, “PGE is number one in the nation for renewable power sales to residential customers and number two for total sales in kWh. We see [renewable energy](#) moving into the mainstream through power sources such as the wind farms in the Columbia Gorge. The trend in the Northwest is toward energy efficiency merging into smart energy consumption with the goal of heading toward carbon free power.”

Hinckley believes that companies who focus on energy reduction and sustainability will be in the forefront in the next 10-20 years. This focus on energy consumption is especially important for technology companies. According to IDC, by 2010 for every \$1 spent on hardware, 70 cents will be spent on power and cooling and by 2012 for every \$1 spent on hardware, \$1 will be spent on power and cooling. Hinckley encourages companies to ask “How do I use the least energy possible and use clean energy responsibly?”

EasyStreet – moving to renewable energy and reducing data center power consumption

Rich Bader, CEO of [Easystreet Online Services](#) described how EasyStreet has morphed into a managed-services provider with a data center with hundreds of servers. Bader indicates that his company faces both the excessive use of energy and energy costs. “We estimate that 25% of the cost of our server racks is providing energy. In addition, 1.5% of all power in the U.S. is used in data centers,” said Bader.

An EasyStreet “Green Team” made it a goal to determine how to reduce the energy consumption of servers in its data center as well as to move to a renewable energy source. At the recommendation of the Green Team committee, EasyStreet joined the PGE Renewable Power program and now powers half of its data center and all of its office space from wind turbine farms in the Columbia Gorge. EasyStreet is also planning to build a new larger data center and is looking at ways to conserve energy as the company plans the center.

“While buying renewable energy is currently more expensive, we feel it is important to do well and to do good and we are finding customers want to do business with us partially based on our decision. The cost of constructing and operating a data center is increasingly dominated by energy and the rapid growth of our industry is spurring innovation in energy management. We are committed to making our new data center a green showcase. We may spend more money up front but it will pay off in the long run in terms of reduced energy consumption and an improved carbon footprint,” said Bader.

Reducing power consumption through software virtualization

In a typical data center, servers run only one or a small group of applications or a single server may be dedicated to information for a

specific department in a company. This results in a large number of servers that are not used efficiently. Research by IBM shows that, "The most important contributor to energy consumption in a data center is utilization rates of the systems. Utilization for x86-based servers is typically only 10% and storage utilization is about 25%," said Al Thomason.

Software virtualization technology lets the hardware resources of an x86-based computer be "virtualized" to create a fully functional virtual machine that can run its own operating system and applications. This allows a server to run multiple instances of applications or an operating system on a single server, while maintaining or improving reliability and scalability. Bader states, "At EasyStreet, we are using virtualization to combine the applications currently running on 15 servers onto two redundant machines, resulting in a significant reduction of servers and the power they consume. We've also seen an anticipated increase in reliability due to the redundant configuration."

Research by IBM shows that data centers typically consume 15 times more energy per square foot than a typical office building and, in some cases, may be 100 times more energy intensive. IBM is committed to energy reduction through their **Big Green program** which is designed to help customers achieve greater energy efficiency. IBM is working jointly with PGE to reduce energy consumption in IBM data centers. Through virtualization, IBM consolidated information on 300 servers down to 6 servers resulting in a reduction of 80% of its energy and facilities consumption across 40K square feet. The company has also developed Mobile Thermal Modeling technology and has used IBM heat exchanger technology for a 60% reduction in heat.

Virtualization and energy reduction at the processor level

Intel is actively involved in lowering energy consumption by building **virtualization enhancements** into its processors and working with various virtualization vendors, such as VMware or the open source software Xen project, to guarantee that software virtualization will work with Intel processors. Smith discussed how Intel is also building power saving and energy consumption into its products at the processor level.

"Intel's NetBurst™ architecture currently runs 130-180 watts per core. Intel's new generation of chips will build in energy savings at the substrate level. This technology will use 12 watts per core with a goal of reducing energy consumption 50% per core", said Smith. During the panel discussion it was suggested by the speaker from Intel that perhaps a new law of data center computing energy use should be created and named Thor's law (after PGE's Thor Hinckley) that states: Over time, as data center energy use decreases there will be a corresponding increase in computing power (teraflops).

"Oregon is blessed with abundant renewable energy in our wind and solar capabilities. Renewable energy will be the cornerstone of energy production in 10 -15 years. While companies like Intel are building reduced energy consumption into their products, consumers must be willing to pay a premium to use renewable energy," said Smith.

What can my company do to reduce energy consumption?

The panel provided these answers to the question: What can my company do to begin to reduce our energy consumption?

- **Software virtualization:** Incorporating software virtualization can result in big savings in under utilized hardware and will reduce energy consumption.
- **Look at power usage in PCs:** Older desktops may use up to 60 watts of power while laptops use about half of that. Newer PCs are also constructed to meet energy reduction goals. Look at your PCs currently in use to determine if some of them should be phased out to lower power consumption.
- **Collect data and have a power management plan:** Each company should first know how much power they are currently consuming. Do research to find a baseline of energy usage. Develop a method to show the benefits and efficiencies in energy saved. Develop a power reduction goal and then a plan on how to reach this number.

- **Create an energy/sustainability group:** Create an employee group that is passionate about sustainability and energy reduction. This group does not need to be just technical staff. Corporate management must buy into energy reduction as an important goal. Consider moving to renewable energy as a corporate strategy.

Linda Barney is the founder and owner of Barney and Associates, a technical and marketing writing firm. Founded in 1990, Barney and Associates specializes in technical writing, documentation, online help, web content, and training. Barney and Associates also provides a wide range of marketing writing services including creating media articles, white papers, data sheets, solution briefs, case studies, web content and reviewer's guides. Contact Linda at linda@barneyassoc.com.



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