

A New Energy Model for Data Center Facilities and Operations Management

Data center construction and management have become increasingly important tasks for you as Facilities and/or Operations Managers. At the same time, energy costs have grown to become a significant portion of your data center's operating expenses. Data center energy costs in the U.S. are expected to rise by 15% per year, based on increasing energy prices and the rapid expansion of data centers. The number one constraint for data center growth is not space, but access to power. In addition, the carbon emissions associated with data center energy consumption is experiencing scrutiny, and some version of carbon emission regulation appears likely in the near future. The growth of the data center market, the increase in energy costs, and a new focus on minimizing the generation of greenhouse gases have all combined to cause operations and facilities teams to rethink data center operating models. Power Assure can help tackle a large part of this problem by cutting your data center energy costs in half.

On average, electricity represents 25% of a company's total IT costs. The root cause of this fast-growing expense is that data centers are managed to remain "Always On," reflecting the premise that you cannot accurately predict data center demand. You are therefore forced to build to meet peak customer load, and assets – servers, cooling, and even lighting – are turned on all the time in a data center. Otherwise, it is argued, valuable customers will not have access to your services and applications when they need them.

The Data Center: Translating fixed costs into variable costs

Within most organizations, data center energy costs have traditionally been viewed as fixed. As a result, reducing data center energy costs has been seen as an intractable, capital-intensive problem. Thus if a downturn hits, the only quick option to cut costs is to cut people, which are your most important assets. When the economy rebounds, new people have to be hired and trained, an enormous cost to productivity. Power Assure allows you to understand the exact cost per user for each transaction your data center performs, thus changing your power costs from a fixed cost to a variable cost. This not only gives you better insight into your cost per customer, but allows your energy costs to go up and down with actual customer demand. No longer are your energy bills "fixed". With Power Assure, you pay only for the power you need to support immediate customer demand. As demand increases, Power Assure brings more servers online, automatically. As customer demand decreases, we turn off servers that aren't needed. The result is a consistent, low cost per customer that accurately reflects the cost of your business.

Moving your data center from “Always On” to “Always Available” with Power Assure

Just turning on a server consumes 70% of its maximum electrical load. When the application is running on the server, power load varies anywhere from 70% to 90%. The problem with the “Always On” model is that during non-peak periods, when servers are not fully utilized, they are still drawing an average of 70% of their maximum electrical load. Today's servers—even the newest, most efficient servers—vary their electrical demand between 60% and 100% based on load, while your actual application load may vary from 5% to 95%.

The solution is to move from an “Always On” model to an “Always Available” model. This doesn't mean you need fewer servers. You still need to be able to meet peak demand. But with Power Assure's “Always Available” model, your servers are brought online and offline dynamically, in real time, with server supply matching actual customer demand. As a result you still have all your capacity to support peak demand but you actually run fewer servers at higher utilization during low demand cycles. Because our system is fully automated, it does not require manual interaction. Furthermore, it does not require any additional software on any of your servers. Finally, it is safe and easy to install. And the results speak for themselves. As demonstrated during a Silicon Valley Leadership Group case study with Accenture, savings of up to 70% are achievable on server farms with an average utilization of 25% and peak utilization of 85%.

When using Power Assure's software, your server assets will be continually monitored; your actual customer load via your load balancer or your virtualization software will be analyzed; and our real-time engine will calculate the optimal number of servers needed to safely support your service demand based on your service level guarantees. Spare capacity buffers can be defined by you and your organization to support spikes and unexpected surges until additional servers come online.

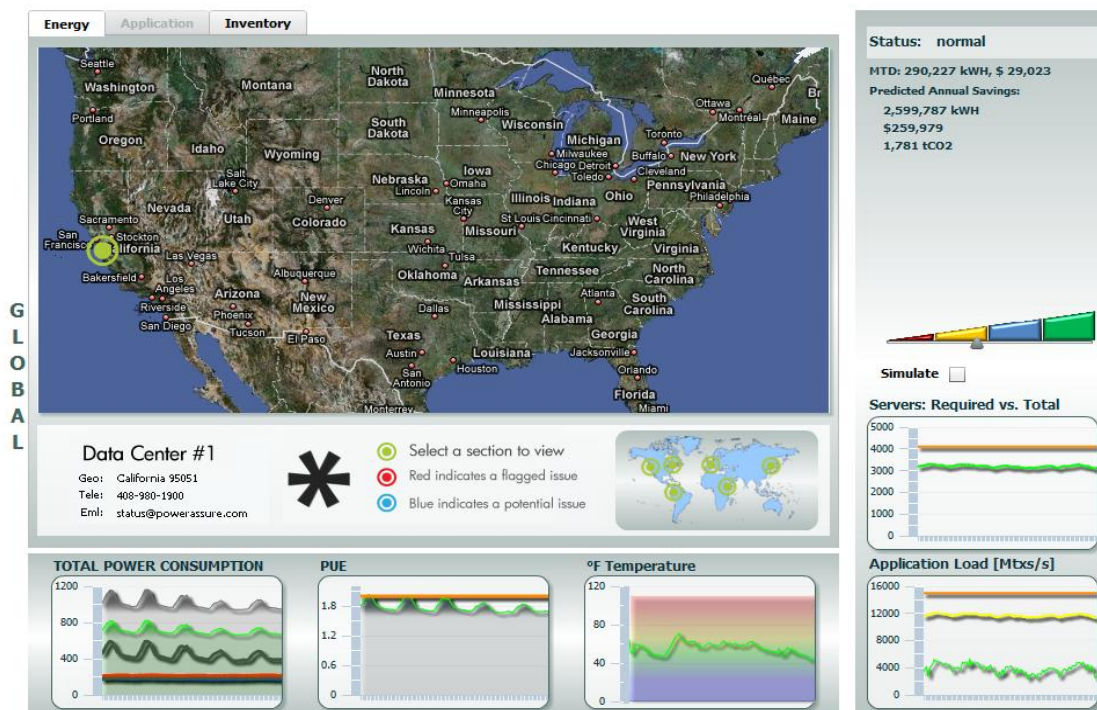
Power Assure's online database tracks all of the assets in your data center, including power draw and service level requirements for your customers. By dynamically adjusting the number of servers online or offline at any time, Power Assure allows you to achieve a constant utilization of your “needed” servers at 75%-80%, resulting in a corresponding flat (and much lower) cost per transaction and overall energy cost.

Power Assure's “Holistic” Management Dashboard

As a Facilities and Operations Manager, you are likely concerned about monitoring where all of your power is going and how efficiently it is being used. Power Assure designs a customized dashboard that brings to one screen all of your various measurement tools and applications. First, we integrate all of your sensors, reporting software, and information from all of your electrical supply equipment—from the meter all the way down to the outlet in the smart rack. Then we add inside/outside temperature, application load, and server reference data. All of this data is consolidated onto a single screen. This allows you to view all of your data centers around the globe on a single page, or to drill down into a single server in a single

rack on a specific floor of a specific data center to see how power is being consumed. In addition to reporting total power usage, we break the power down in each of its three phases, to make sure your power distribution is balanced. The ability to track and monitor your power usage accurately helps not only with capacity planning, but with quickly identifying problem areas or inefficiencies in the system, allowing you to correct them and save. Adding temperature shows dependencies of the mechanical equipment based on outside/inside temperature and allows you to correlate temperature with overall power consumption. Similarly, integrating application load (for each application) allows you to understand average utilization, peak demand and its dependency on power consumption.

A sample dashboard screen is provided below. The presentation of the dashboard is customized based on your needs.



08.57.215.130

© Copyright 2006 - 2009 Power Assure, Inc., All Rights Reserved

The Power Assure Dashboard shows all relevant data in a single screen.

“Save as you go” implementation

Power Assure delivers its software as a service, with all processing taking place in its secure data center. We measure demand and supply constantly from your existing equipment, balancing the two once every minute. Because we don't install any client software on your servers, we can implement our platform safely and quickly. In addition, we work with the management system you have in place and do not require any changes in your overall system or network management software. A typical first

installation takes just a day or two to establish a “baseline” of energy use, and 2-4 weeks before you start to realize savings. Typically, we start in just one suite of your data center to establish the optimum parameters for savings and customer response. When you are satisfied with the installation and the first suite is saving you money, we expand at your pace.

Working with utilities to qualify for rebates

Our team of utility experts will work with you to get the largest rebate possible from your local utility using our “before” and “after” baselines. In addition to reporting the energy and dollar savings, Power Assure also monitors your resulting carbon savings, providing you with the data you need to optimize your “green” credits under potential emissions regulations. All of the historical and real-time data is stored offsite in our secure data center for three years.

Power Assure saves you money

Data center energy costs will increase significantly over the next five years. Emissions legislation will likely further escalate these costs. But these changes can be an opportunity to drive your business toward greater efficiency. Every dollar cut from your electrical bill flows straight to the bottom line. Power Assure will convert your data center energy bill from a fixed cost to a variable cost, reducing it by an average of 50% as a result. These savings are not only good for business, but help improve your corporate environment image as well.

Contact Power Assure to get started

Let us demonstrate how Power Assure can help you reduce your energy costs. Contact us at sales@powerassure.com

© 2009 Power Assure, Incorporated. All rights reserved.

Power Assure and the Power Assure logo are trademarks of Power Assure, Inc. All other product names, company names, logos, and trademarks are used herein for identification purposes only and are the property of their respective companies. Rev 081709 PN009

www.powerassure.com