HP Insight Control Environment

Power management for HP ProLiant and BladeSystem servers—with Dynamic Power Capping

It has never been more important to monitor and control energy consumption in the data center. Energy costs are skyrocketing. "Green" concerns are universal. Increasing demands for computing power are putting more stress on power and cooling systems—which according to some estimates already require about 1.5 watts for every watt the servers use[1].

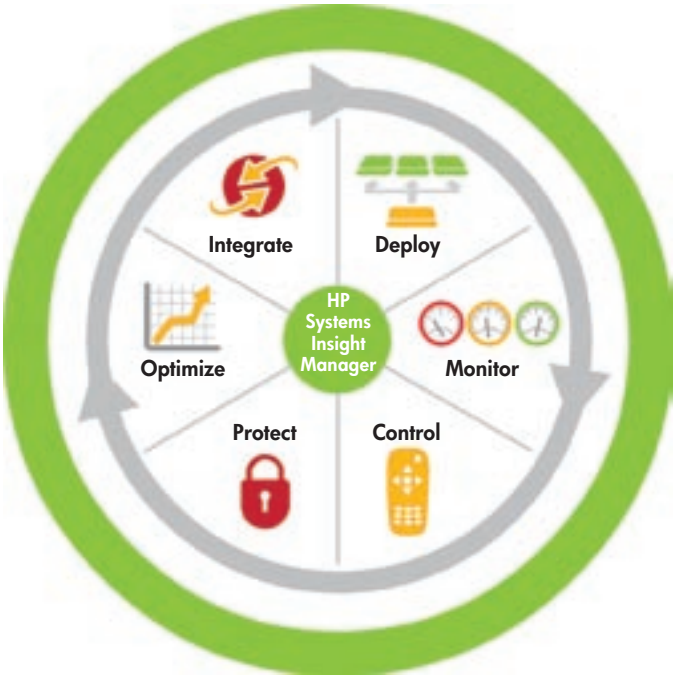
Clearly it is vital for organizations like yours to monitor and control energy costs—whether you operate in one location or at data centers scattered across the globe. Whatever your situation, you're likely to face energy challenges in four areas:

- Space limitations force your IT organization to squeeze computing capacity into footprints already pushed to the limit.
- The cost of power and cooling the IT infrastructure approaches and even exceeds the cost of acquiring the assets themselves[2], increasing the importance of effective cost control.
- Management issues arise between your IT and facilities departments over how many servers can fit in the data center.
- Lack of control over power and cooling, combined with concerns about unplanned outages due to over-subscription, encourages over-allocation of power and cooling resources, effectively trapping multiple kilowatts of power within the data center.

You could choose to resolve these challenges by building a new data center and hiring additional IT staff. However, given the high cost of construction and operational expenses, that is the choice of last resort.

More likely you'll need to find ways to fit higher-density servers into existing facilities, enable existing resources to maintain more systems, or both. In all cases, HP Insight Control Environment (ICE), now available with Dynamic Power Capping, provides accurate measurement of actual power usage and

HP Insight Control Environment extends HP Systems Insight Manager (HP-SIM) allowing customers to easily deploy, monitor, control, protect, and optimize their HP ProLiant and BladeSystem infrastructure.



ambient air temperature. This helps you understand your true power and cooling requirements instead of relying on faceplate or power calculator estimations. ICE with Dynamic Power Capping also safely limits (or caps) power consumption at user-defined levels, allowing IT organizations to reclaim unused power and cooling capacity—and up to triple the capacity of their existing data center[3]. By delivering accurate power measurement and control, ICE helps you deliver the IT services your business needs with the facilities resources you have at your disposal today.

Energy savings that are easy to purchase and use

HP Insight Control Environment with Dynamic Power Capping helps transform your data center into a best-run server infrastructure by providing energy-efficient management built on HP Systems Insight Manager (SIM), HP Integrated Lights-Out 2 Advanced (iLO 2) remote management, and HP Insight Power Manager software—all in a convenient package that is easy to purchase, install, and extend over time. The result is a robust solution that delivers full remote control and power management for both ProLiant servers and BladeSystem enclosures through a single, unified user interface.

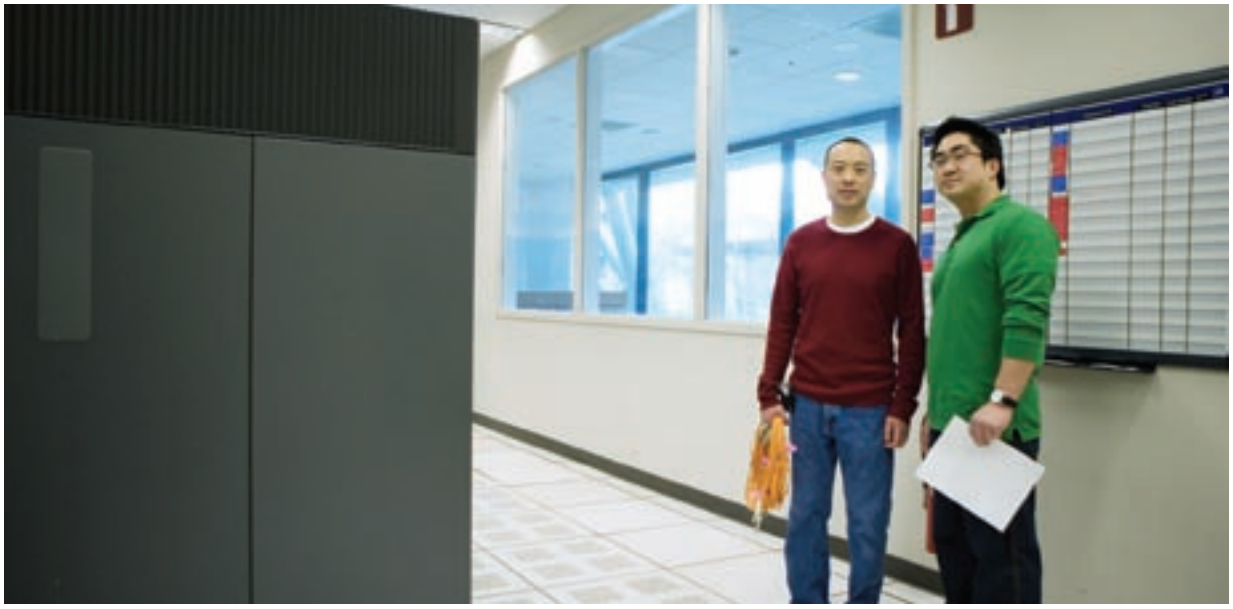
ICE now includes one year of Software Technical Support and Update service, providing rapid access to HP support staff and proactive delivery of software updates.

Power management with Dynamic Power Capping

Effective power management is a function of three important capabilities: the ability to measure power consumption, the ability to regulate power usage, and the ability to cap power consumption at a specific level. The combination of these capabilities allows you to better understand required power budgets, reduce the total amount of power that servers consume, and reclaim power and cooling overhead and apply it to powering servers.

Power measurement

HP Insight Control Environment, via the iLO 2 Management Processor and Onboard Administrator, accurately measures power consumption for individual ProLiant servers or BladeSystem enclosures. Users can display graphs of up to three years of peak and average power consumption, as well as server temperature data for individual servers and enclosures or groups of servers and enclosures. HP Insight Control Environment also displays the cost associated with powering and cooling servers and allows power consumption and server temperature data to be exported for use in other reporting packages. Power measurement data helps customers compare individual server or rack level power budgets with actual power usage numbers, then make budget adjustments based on current consumption and anticipated need.



HP Insight Control Environment provides the following capabilities

Measure	Accurately measure power usage and ambient inlet air temperature over time to predict future power management needs
Regulate	Automatically adjust processor clock speeds based on workload requirements to reduce overall power consumption
Cap	Safely limit power consumption without performance degradation to reclaim trapped power capacity and fit more servers within existing data center infrastructure

Note: In December, 2008, Dynamic Power Capping will support the following ProLiant systems: BL2x220c G5, BL495c G5, BL460c G1, BL460c G5, BL260c G5, BL465c G5, BL685c G5, c7000, DL360 G5, DL380 G5

Power regulation
HP Insight Control Environment, via the iLO 2 Management Processor, regulates server power consumption by adjusting processor P-states[4] in accordance with workload requirements. This allows servers to make use of full processor performance when needed and to conserve power for less demanding workloads with no impact on performance. HP Insight Control Environment will also forecast power cost and estimate savings associated with power regulation technology.

Dynamic Power Capping
Dynamic Power Capping in HP Insight Control Environment represents a significant advancement in power management. Unlike previous power capping technologies, Dynamic Power Capping safely limits power usage with no performance degradation or risk to electrical infrastructure, with circuit protection. For single rack servers, power caps applied via the iLO Management Processor will limit power usage to a specific watt or BTU/hour level. For enclosures of blades, users can set an enclosure-level power cap, and the Onboard Administrator will dynamically adjust individual server power caps based on their specific power requirements. By capping power usage at historical peak power usage instead of significantly higher faceplate or power calculator default values, IT organizations can fit up to triple the capacity of their existing rack infrastructure[5].

Ideal environments

HP Insight Control Environment with Dynamic Power Capping is ideal for environments such as:

- Capacity-constrained data centers that
  - Are looking for a way to extend the cooling capacity of their primary data center
  - Have watts-per-square-foot limitations that prevent a rack from being filled to capacity
  - Anticipate needing to build a new data center, but first want to do all they can to extend the life of their existing one

- Mid-market customers who are purchasing floorspace from service providers and who
  - Want to gain a greater understanding of the amount of power their servers are using and how that relates to their overall outsourcing bill
  - Want the ability to fit more servers within their allocated rack space
  - Want the option to put all servers in lower power consumption during off-peak hours

Ordering information

HP Insight Control Environment with Dynamic Power Capping

Ordering HP Insight Control Environment is easy. Orders can be placed online at **www.hp.com/go/ice** or through your local HP representative or partner. When ordering HP ICE, you will need to purchase the required number of licenses and then choose to either download the Insight Control Management DVD ISO or purchase a single Insight Control Management DVD media kit. Software and trial licenses may be downloaded at **www.hp.com/go/tryinsightcontrol**.

Software Technical Support and Update service

One year of Software Technical Support and Update service included with the purchase of ICE. This grants you access to trained support staff for help in quickly identifying and troubleshooting installation and configuration issues, as well as proactive notification and delivery of software updates, to help you get the most out of your investment in ICE.

Technology for better business outcomes

By relying on HP management software, you gain the capabilities to strategically link business processes with IT, automate and simplify key tasks, and cost-effectively match IT assets with business demands. You transform IT so that it becomes a force to drive business success. This approach is central to our belief that technology should enable better business outcomes.

[1] Belady, C., Malone, C. "Data Center Power Projection to 2014," 2006 ITHERM, San Diego, CA (June 2006).

[2] The Green Grid: "The Green Grid Opportunity Decreasing Datacenter and Other IT Energy Usage Patterns," February 2007.

[3] Percentage increase in server density compares the number of servers that can be deployed using Dynamic Power Capping with the number of servers that can be deployed using server faceplate values. Density improvements may vary based on how customers budget power and cooling resources.

[4] Processor performance states, or P-states, provide a quick and effective mechanism for adjusting processor power consumption and performance. Both Intel® and AMD® processors support use of P-states to decrease processor power consumption by lowering the core frequency and voltage of the processor.

[5] Percentage increase in server density compares the number of servers that can be deployed using Dynamic Power Capping with the number of servers that can be deployed using server faceplate values. Density improvements may vary based on how customers budget power and cooling resources.

Technology for better business outcomes

To learn more, visit www.hp.com

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