

Platform Dynamic Power Optimizer

Reducing the Data Center's Energy Footprint

Highlights

- Automated dynamic power management
- Dynamic cost optimization scheduling
- 'Hot Spot' temperature leveling of the data center
- Customizable policies for optimizing workloads with host power management
- Resource demand, capacity and power usage reporting

Benefits

- Reduce energy consumption and costs by letting application workloads drive power usage only when needed
- Maximize power efficiency across a dynamic shared infrastructure
- Gain greater visibility and control over data center resources and energy expenses
- Meet corporate and government mandates for green initiatives
- Promote corporate profile by enabling a 'green' data center

Overview

Data center energy costs are rising rapidly, affecting the bottom line. According to IDC, 50¢ is spent to power & cool servers for every \$1 in server spending today and will increase to 70¢ by 2010. Data center energy consumption is estimated to account for the bulk of more than a quarter of global CO₂ emissions from information and communications technology.

To address these challenges, Platform Dynamic Power Optimizer, which leverages Platform Enterprise Grid Orchestrator (EGO) technology, provides a unique energy saving solution that enables you to cost effectively power your data center by letting application workloads drive energy consumption only when needed. Through deploying green strategies such as energy cost, and power usage optimization, and 'hot spot' temperature leveling of the data center, Platform Dynamic Power Optimizer maximizes application workload throughput while reducing power and cooling costs.

Energy Cost Driven Scheduling – Higher throughput, lower costs

Power costs typically change throughout the course of a day and week according to aggregate demand. By leveraging the application workload characteristics, resource requirements, and priorities, Platform Dynamic Power Optimizer optimally schedules workloads to periods when energy costs are lower without compromising SLAs. Through customizable price-aware scheduling policies, administrators can schedule only high priority workloads during the highest power cost periods to ensure business goals are met. Lower priority workloads can be deferred to a less costly time of day.

Power Efficiency Optimization – Powered-on only when needed

Platform Dynamic Power Optimizer power management lets workload manager policies and requests drive host power utilization. By monitoring workload resource requirements, environmental conditions such as temperature, and the capacity of the individual hosts in the available server pool, Platform Dynamic Power Optimizer makes intelligent decisions to dynamically power on and off or hibernate specific hosts so that energy costs are kept to a minimum.

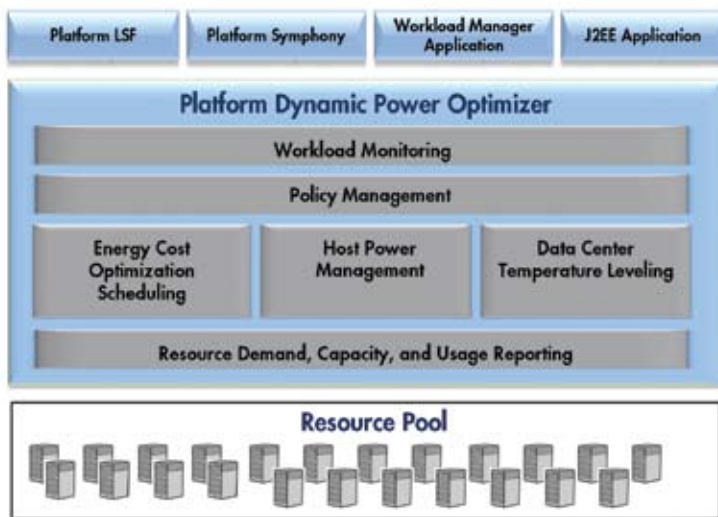


Figure 1. The Platform Dynamic Power Optimizer Solution

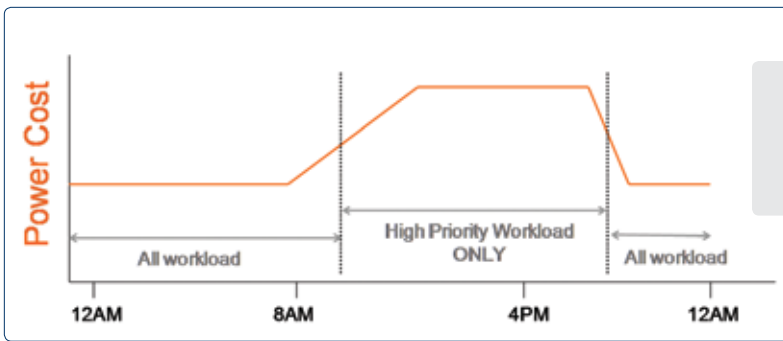


Figure 2. Scheduling only high priority workload in more expensive peak hours

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To reduce cooling costs, Platform Dynamic Power Optimizer employs 'cool node scheduling', in which jobs are launched first on hosts which are at the lowest temperatures. Job slots are filled within the most efficient and highest memory capacity hosts first, before sending them to another host. If additional hosts need to be powered on, servers that are known to consume the least amount of power will be powered on first. By letting the application workload drive power consumption, Platform Dynamic Power Optimizer ensures that not only your jobs are completed quicker and on time, but the minimum number of servers is powered up.

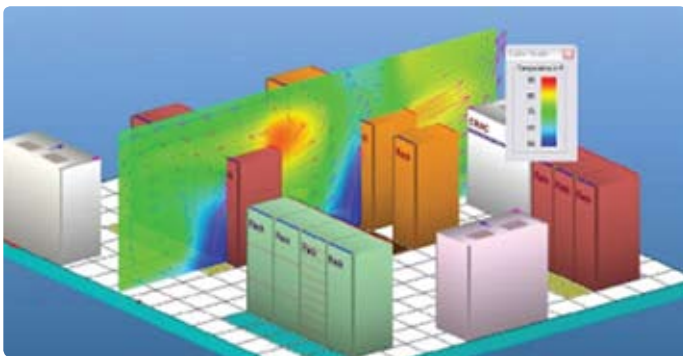


Figure 3. Spatial view of hot spots in the data center

Data Center Temperature Leveling - Minimize hardware cooling costs

Most data centers use central air conditioning units to remove excess heat. Due to concentrations of infrastructure hardware such as servers, switches, storage, and backup units, and the unevenness of workload distributed across various servers located throughout the data center, 'hot spots' are unavoidable. The most common data center HVAC unit is sized to cool the hottest point in a data center down to tolerable levels. This leaves other zones in the data center much cooler than they need be.

By thermally and spatially leveling the temperature of the data center, Platform Dynamic Power Optimizer enables workloads to be dynamically distributed across servers to flatten spikes in zones where there are hot spots. This means that workloads are allocated first to servers in zones that are cooler. By leveling and reducing the overall data center temperature, HVAC units can then run at much less than maximum capacity, and their total power consumption can be significantly reduced. If left unaddressed, hot spots may eventually require the use of higher capacity CRAC units, and can also increase the chance of hardware failures.

Policy-Based Power Management - Stay in line with business objectives

Using Platform Dynamic Power Optimizer, administrators can define policies to dynamically schedule workload according to priority and time-of-day energy costs. Platform Dynamic Power Optimizer also allows administrators to specify and adjust policies to control host power utilization in order to satisfy workload demands. Administrators can specify and tune power control policies such as the number of jobs allowed pending before powering on and off machines, or the minimum number of hosts that must be up at any given time. Administrators can also define policies to specify how long a host should stay up before being powered down. This avoids frequent powering on and off of machines which can cause an increase in power consumption due to 'thrashing', hardware failures, and job latencies due to host boot time delays. Through policy-based workload and power management, administrators can have full control over the use of data center resources and power consumption to ensure costs are in line with the business, yet allow workloads to be completed quicker and most efficiently.

Monitoring of power consumption and ROI

- Manage data center resources and costs

The dynamic nature of shared infrastructure environments makes it difficult to track the fluctuating demand for resources, available capacity, usage patterns, and power consumption over time with standard monitoring tools. The Platform Dynamic Power Optimizer console provides administrators with a graphical interface to report on key demand, capacity, and usage metrics and over time, including:

- Number of hosts powered up/down
- Number of running and pending jobs
- Host temperature
- Fan speed
- Power consumption (kWh)
- Power savings

Using this information, administrators are able to evaluate and control the effectiveness and ROI of the green dynamic data center, and tune power and provisioning policies to achieve greater data center efficiency as business demands change over time. In addition, armed with power usage and savings information, administrators can confidently plan, project, and control data center energy costs.

Platform™

Platform Computing provides software that dynamically connects IT resources to workload demand according to business policies. Over 2,000 of the world's largest organizations rely on our solutions to improve IT productivity and reduce data center costs. Platform has strategic relationships with Dell™, HP, IBM®, Intel®, Microsoft®, Red Hat®, and SAS®. Building on 16 years of market leadership, Platform continues to help data centers be more efficient, responsive and dynamic. Visit www.platform.com

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