Addressing energy consumption with IBM Tivoli service management solutions.

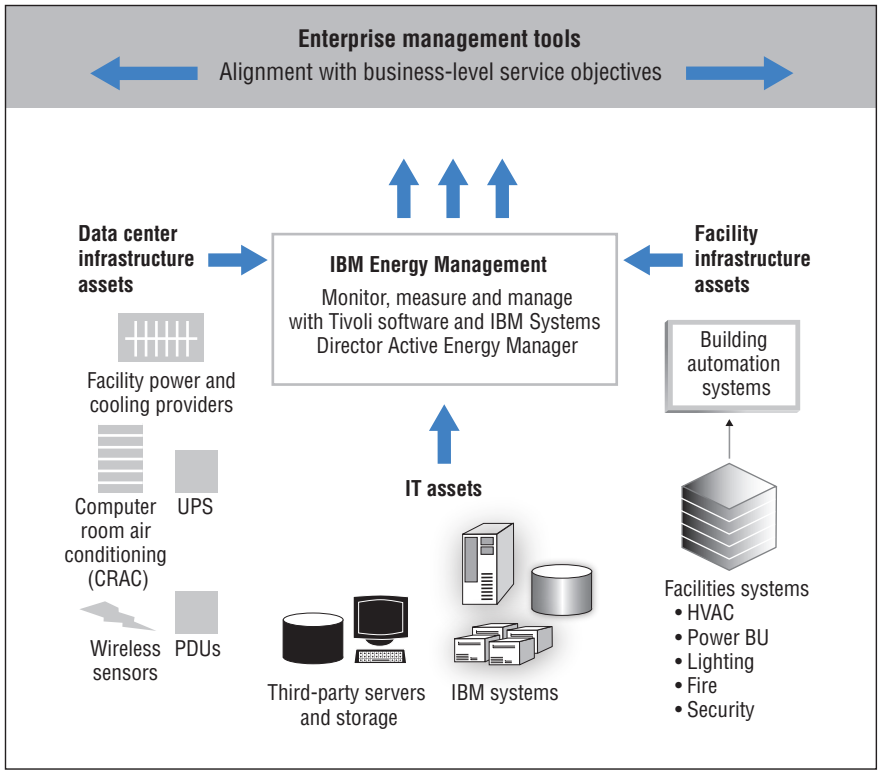
Highlights

- Attain visibility to assess the impact of potential IT energy policy changes to business services; monitor power consumption, thermal conditions and energy-related events and situations; and identify and allocate the cost of IT energy usage
- Provide control to manage energy across both IT and facilities resources
- Enable automation to shift workloads within or between data centers to help save costs or respond to energy events

For years, most data centers consumed power and space with little consideration for energy costs or supply. Now, however, analysts are predicting that power will be the number one issue in the next two to four years.*

After years of stretching the limits of space, power and temperature, data centers literally may be out of power, space and the ability to provide the proper computing environment. The demand for energy is becoming so great that it is outpacing supply and driving up costs — not just energy cost factors, but the cost of data center and office space. Along with the desire to reduce the carbon footprint, the exponential growth in power costs, limited space and data center environment control are all driving the recognition that managing energy is of critical importance in today's data center.

Just as important as reducing energy consumption, however, is the way in which it is approached. The use of blade servers helps save on the high cost of data center space, but can increase the amount of heat and power required. Knee-jerk reactions to soaring energy costs — even just slightly raising the temperature — could have major, unintended consequences for response times and service levels. What's needed is an end-to-end view of IT resources, services, IT and facilities assets, energy costs and response times. With this increased visibility, you can accurately assess the potential impact of energy policy changes on the services that the energy supports. That



way, you can ensure resources receive exactly the right amount of power needed to meet service level requirements — no more and no less.

Going green with IBM Tivoli software

Applied to energy consumption, the IBM Tivoli® software portfolio and its proven monitoring, event health, performance and automation capabilities can help data centers manage energy more efficiently. Through an integrated approach to managing energy that links IT assets, the data center infrastructure and facilities assets, Tivoli software delivers a holistic view of data center energy consumption in the context of risk. It also allows energy data to be viewed in the context of service management, bringing an energy dimension to existing processes.

Based on IT Infrastructure Library® (ITIL®), Tivoli service management solutions work together to help reduce energy demand. The following capabilities address a range of energy management challenges, offering the chance to capture and monitor how energy is directed throughout the enterprise, track its usage and proactively adjust resources to manage the energy required to meet performance levels.

Efficient IT and facilities asset management

Any energy management solution should address both IT and non-IT assets. Data centers and facilities are becoming more complex and interdependent; likewise, service commitments to the business are the responsibility of IT and facilities management. IBM Maximo® enterprise asset management solutions enable organizations to maintain optimal operating condition of assets such as generators, pumps and other assets which, despite considerable energy consumption, are not normally included in the IT infrastructure.

Input from sensors and monitors embedded in IT and facility assets and distributed throughout the data center allow solutions such as IBM Tivoli Monitoring to capture, monitor and provide management to this input and help optimize the facility's energy management.

Power and thermal management

Bringing energy and IT together offers the potential for greater oversight and control of data center workload and

more efficient use of available energy. Tivoli Monitoring solutions allow you to collect both traditional IT measurements and environmental measurements into a common dashboard that displays an integrated view of power usage, thermal data and application performance metrics.

The information can be aggregated with other performance events and consolidated in IBM Tivoli Data Warehouse to share with other applications for real-time and historical trending analysis. You can also set policies to automatically respond to certain preset thresholds or events to decrease heat generation. In the face of a sudden power cost increase, one example of a possible response is to use these automated power management policies to adjust the power by metering, controlling or capping consumption to save energy while maintaining response times.

IBM Tivoli Change and Configuration Management Database (CCMDB) can deliver a complete perspective on IT and facilities assets through the ability to map and store information about power and cooling resources, their relationships to IT equipment and how the equipment is related to business services.

Visualization and reporting across IT and facilities domains

Visualization promotes quick identification of hot spots and cooling effectiveness — along with the affected assets and, by extension, the services most likely to be impacted. IBM Tivoli Maximo Spatial Asset Management enables visualization of IT and facilities assets, including GIS-based graphical zooming from site to floor. Through this comprehensive view, you can obtain information on power, temperature and layout, as well as identify problem areas. You can also integrate facilities alerts with IT events to provide greater awareness of "cause and effects" for IT incidents, such as whether facilities or IT equipment failed first.

Financial accounting for energy usage, cost and benchmarking

To keep energy consumption and costs under control, you need to be able to determine existing power usage and cost. IBM Tivoli Usage and Accounting Manager enables you to track costs by IT categories such as service or application, or by business categories such as project, division or location. These capabilities can help you isolate costs as they appear and pinpoint the exact context in which energy is consumed, an essential first step to controlling and reducing energy costs. Capturing these costs allows you to benchmark, over time, the savings in implementing a green data center.

Business service management

The benefits of reducing power consumption and costs can quickly evaporate if they're achieved at the expense of critical business services. IBM Tivoli business service management can provide a link between energy management and business processes. Without these links, there is virtually no way of knowing how an energy management decision may impact a given business process. With the right information, organizations can make optimal decisions on energy management, including knowing what service level agreements can be met, how the services are expected to perform if action is taken to reduce power and how much money can be saved by reducing power consumption.

Provisioning in an on demand way

The ability to redistribute workloads to take advantage of lower energy costs during nonpeak hours provides an opportunity to reduce energy requirements. IBM Tivoli Provisioning Manager can distribute software to any network node — whether data, middleware,

applications, operating systems or entire disk-level images — through completely automated scripting. Reducing inefficient server usage by eliminating the overprovisioning of servers for backup, redundancy or spikes in business activity can also create energy efficiencies. Using automated provisioning software, you can more easily track server usage and schedule provisioning of servers "just in time." You can also easily use automated provisioning software to shift provisioning to virtual environments, helping to reduce hardware costs and energy consumption at the same time.

Data center optimization for power

Collecting and monitoring energy usage data is one of the first steps to efficient energy management. Once the data's collected, however, you need the ability to turn the data into insights that enable you to pinpoint specific actions that can be taken to reduce power consumption. IBM Tivoli Data Center Optimization for Power analyzes monitored data — including both IT and facilities equipment data— to help you better understand your data center operations. With this information, you can establish baselines for energy usage to more accurately track and implement improvements. You can also generate reports to quickly distinguish the amount of power consumed, when it was consumed and which services are consuming it. From there, you can link usage with the associated financial costs to accurately identify potential savings associated with power management.

For more information

To learn more about how Tivoli solutions can help you manage energy more efficiently, contact your IBM representative or IBM Business Partner, or visit **ibm.com**/itsolutions/servicemanagement

About IBM Service Management

IBM Service Management helps organizations deliver quality service that is effectively managed, continuous and secure for users, customers and partners. Organizations of every size can leverage IBM services, software and hardware to plan, execute and manage initiatives for service and asset management, security and business resilience. Flexible, modular offerings span business management, IT development and IT operations and draw on extensive customer experience, best practices and open standards–based technology. IBM acts as a strategic partner to help customers implement the right solutions to achieve rapid business results and accelerate business growth.

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