CA ecoMeter helps you to visualize, monitor, and better manage the use of energy in your data centers and facilities. As energy data becomes more important with the advent of cloud computing and virtualization, CA ecoMeter provides energy data points to help make intelligent decisions that can lead to increased operational efficiency and reduced consumption.

Overview

Increased business dependency and demand has led to an increase in both technical complexity and higher energy consumption within data centers and facilities. With CA ecoMeter, data center and facility managers can leverage more accurate and meaningful real-time data. This information can then be used to help reduce over-provisioning and redundancy in IT, identify data center capacity (space, power, cooling), and reduce energy operating costs.

Benefits

With CA ecoMeter, organizations can better:

- Collect data from multiple sources and from devices supplied by a very wide range of vendors, so you can maximize your value and use a single system
- Create standard and custom metrics such as PUE, so you can benchmark your data center, facilities equipment and IT assets to find energy savings
- Analyze power load and consumption across multiple devices, systems, buildings and data centers, so you can compare devices by identifying outliers
- Report via real-time access to live and historical data on status, efficiency and other factors allowing users to identify energy waste
- Use intelligent alerting to identify problems and reduce false alarms
- Control both physical equipment and virtual environments, to achieve greater savings
Helping reduce energy consumption

CA ecoMeter helps organizations improve the management of power and cooling in the data center and as a result, reduce energy consumption. As demand for IT services increases, data center costs also continue to rise. CA ecoMeter helps both groups: building and facility managers and those responsible for IT servers, networking, and storage, to work together to manage three key areas of data center infrastructure management: energy and power automation, power capacity management, and data center operational management.

Energy and power automation

CA ecoMeter is designed to provide a bridge between facilities infrastructure assets and IT devices. With CA ecoMeter, you can visualize, monitor, and better manage the use of energy in your data centers to help reduce your overall energy costs. By controlling physical cooling systems and managing virtual environments automatically, CA ecoMeter can quickly provide detailed information on power and environmental conditions down to the granular detail of individual assets for a full range of facilities infrastructure and IT devices.

Power capacity management

Reducing the cost of avoidable power outages is a significant challenge for data center managers. In most cases, if a data center manager has any visibility on power consumption it will be for the facility assets, i.e. the UPS, PDU and CRAC units. If there is visibility on the IT power consumption it will be from a different system and there will often be no integration between the two systems. In many cases a data center manager will not know until after the outage has occurred whether this is due to a power outage, overheating or another environmental factor. This limits the ability of data center managers to automate the power management of their facility. CA ecoMeter is designed to automatically identify the source of power capacity and can accurately identify overheating issues at a device level thus minimizing the risk of outages and reducing the adverse effects on service levels.

Data center operational management

As power capacity limitations intensify, data center operational management becomes even more critical. Service outages are often due to power. Organizations recognize they must extend their end-to-end service monitoring to include the physical infrastructure supporting the IT equipment. With CA ecoMeter you can leverage intelligent alerting to more quickly and accurately detect undesirable energy and environmental conditions in your data center, such as temperature and humidity or power capacity at a rack or PDU level, which can cause outages jeopardizing service quality and SLAs. With advance alerts, you can also identify symptoms before they become a crisis.

5 steps towards operational energy management

CA ecoMeter supports a series of key steps towards more reliable and efficient operational energy management. You can decide to focus on one of these steps, if only one of them is of importance to your organization, or you can take a broader view and focus on multiple steps. The five steps are: Collect, Analyze, Report, Alert and Control.
Collect

CA ecoMeter gathers data from energy and IT devices via SNMP, Modbus, and BACnet protocols without requiring any additional hardware. If you have an existing Building Management System (BMS), CA ecoMeter can be integrated so that advanced analytics and reporting capabilities can complement existing BMS functions. CA ecoMeter also can be integrated with Cisco EnergyWise architecture to gather power and energy data from not only network devices enabled with Cisco EnergyWise (such as switches, routers and IP phones), but also third-party rack PDUs enabled with Cisco EnergyWise firmware. The data which is polled, calculated, gathered, and stored is not only live, but also historical, providing a baseline, so that when change occurs you have a starting point from which to measure the results of the change. With CA ecoMeter, you can:

- Integrate with devices supplied by a very wide range of vendors
- Gain rapid access to granular detail through the historical repository
- Leverage the CA Technologies gateway to communicate with SNMP and non-SNMP devices
- Supports SNMP, Modbus TCP, Modbus Serial RTU and BACnet
- Integrate with UPS and power strips
- Perform advanced calculations, with results stored as time series data
- Have access to proprietary MIB with variables/scalars defined in MIB tables
- Integrate water, fuel and environmental data
- Track PDU, UPS, CRAC, and Generator utilization, status and more
- Monitor panel and breaker utilization to identify overused and underused circuits

Figure A.
CA ecoMeter collects data from a variety of devices and aggregates data into a global view.
CA ecoMeter

Analyze
CA ecoMeter provides immediate access to live and historical reporting with direct correlation between power-related metrics and, when integrated, even with IT metrics like CPU, Disk and I/O. Phase load is monitored as well. With CA ecoMeter, you can take the data polled from meters and sensors in your environment and categorize it in ways that reflect the structure of your environment. The data which is polled, calculated, and gathered, is both live and historical. CA ecoMeter has the ability to calculate and store interpolated data from the polled data points and perform simple and complex calculations, such as PUE or BTUs of heat removed by a CRAC unit, for every polling interval. For example, you can look at all of the devices that contribute to cooling load, efficiency of an individual CRAC unit, or aggregated power at a rack level. Or, you can view all of the data points in a single physical location. CA ecoMeter can help deliver greater granularity, flexibility and insight by performing analysis on a variety of key metrics including: load distribution, top offenders, total IT load, and phase load. This information can be aggregated at the local, regional and global views, with drill-down to details.

Figure B.
CA ecoMeter tracks utilization of systems, such as PDUs, and identifies where spare capacity exists.

Report
CA ecoMeter ties together data points from disparate systems that relate to power load, cooling, IT, or other factors. It combines them to generate metrics like PUE or other custom calculated metrics. This kind of flexible and granular reporting provides a baseline for your environment before a change, and monitors it after a change without the need to base all of the numbers on estimates and assumptions. This helps enable your organization to compute the real ROI from reductions and help deliver the proof points needed to fund other efficiency projects.
Some organizations may want to show their customers how much power their IT services are costing. For some managed service providers, for example, there is real charge back for electricity use. Other organizations may want to “show back” consumption or cost data to customers or departments for informational purposes alone, to provide greater transparency to what is consumed when providing them with a service. CA ecoMeter creates chargeback reports instantly, at the click of a button, saving time and expense. It also provides a range of other live and historical reports, ranging from “Top N” outlier reports to real-time PUE trending and reporting. Automated delivery to a user or a distribution list and publishing of reports to a portal such as Microsoft SharePoint can be performed using the CA ecoMeter job scheduler.

**Alert**

Managing energy in the data center is also about taking action. CA ecoMeter continuously monitors your data center. With intelligent alerting, the software can automatically recognize an anomaly and send an alert. This alerting can look for deviations-from-normal patterns, meaning fewer false alarms. The system alerts an administrator of the anomaly and also informs the IT management system and the service desk. Your team can quickly review the historical reports, and more easily determine the root cause and resolve the problem. Intelligent alerting goes beyond conventional threshold-based alerting which is often susceptible to false alarms. With CA ecoMeter you can use sophisticated time-over-threshold or deviation-from-normal alerting techniques to identify patterns which require attention. As well as being able to alert people, the system can also be integrated with a wide range of other systems to integrate alerting with other management processes.
• Advanced alerting helps identify symptoms before events become a crisis
• Time-over-threshold
• Deviation-from-normal
• Integrate with CA Service Desk to generate incidents and assign technicians
• Impact analysis via integration with CA Configuration Management Database (CA CMDB)

Figure D.
CA ecoMeter advanced alerting flags areas of major potential concern as “critical” and sets rules such as time-over-threshold and deviation-from-normal.

Control
CA ecoMeter can respond to changes in the environment by automatically adjusting physical equipment. For example, as IT activity increases substantially, the cooling need may increase as well. A variable frequency drive-enabled fan, which the system kept optimized at a low speed before, can be increased automatically to keep IT equipment temperature at acceptable levels. When temperature drops back and the elevated speed is no longer needed, the fan speed can be automatically reduced.

Automation and control extends to virtual environments as well. When the number of virtual machines on a server increases, the IT load may increase as well. The physical machines or the rack containing those servers may also be reaching power capacity limits. CA ecoMeter can generate another intelligent alert and automatically the software can trigger the transfer of that virtual machine to a new physical location. Advanced analytics using the CA ecoMeter Calculation Engine, and advanced alert generation using the CA ecoMeter Exception Engine, play a key role in triggering these controls effectively.
Through integration, CA ecoMeter can also enable virtualization automation:

- Moving virtual machines between racks or locations
- Power capping of racks
- Active, policy-based power management
- Utilization of alert engines to integrate with virtual management tools

**Figure E.**

With CA ecoMeter, a virtual machine can be moved from one physical host to another between racks or locations.

**What’s new in CA ecoMeter r3.0?**

CA ecoMeter release 3.0 delivers powerful new capabilities to support power management for data centers and IT.

- Mobile integration for insight into real-time data for data center staff and management
- Support for Cisco EnergyWise for bi-directional Cisco EnergyWise integration
- Enhanced CA ecoMeter Gateway
- Template-driven automatic discovery for rapid implementation and maintenance
- CA ecoMeter Probe for Nimsoft, enabling SaaS deployment
- Integration with CA Application Insight Module for virtualized environment management
Mobile integration
Mobile integration allows data center staff and management to view CA ecoMeter data on their mobile device, and see how their data center, facility, or any element is performing anywhere in the world. With mobile integration, CA ecoMeter users will have:

- Access to data in real-time directly from their mobile devices
- Administrator rights to pre-select individual attributes of elements to send to mobile device
- Have secure passwords to access data
- See data for the time period before it was first configured in order to compare present and past data

Figure F.
Cisco EnergyWise Executive Dashboards

Bi-directional Cisco EnergyWise integration
With bi-directional Cisco EnergyWise integration, CA ecoMeter users can now receive data from multiple EnergyWise switches in order to support all equipment within CA ecoMeter. The integration allows users to:

- Enter the domain and IP address of EnergyWise switches CA ecoMeter will monitor
- Select which devices for a particular switch CA ecoMeter will monitor
- Access the granularity to see the usage for the PDU (consumer) as well as each plug/outlet (metered) on the PDU
• Turn EnergyWise devices on and off using CA ecoMeter, to reduce energy use and have more control

• Change the value of an attribute for an EnergyWise device, to control these attributes from within CA ecoMeter

• Provide energy data to EnergyWise in order to use the CA ecoMeter Gateway to expand the monitoring capabilities of EnergyWise

**Enhanced CA ecoMeter Gateway**

While many facilities collect and store time series data about facility equipment, CA Technologies recognizes there is diversity among BMS data storage and that device integration with our CA ecoMeter is a critical component of any successful deployment. CA ecoMeter Gateway enables data center and facility managers to integrate CA ecoMeter with a variety of energy management products to more easily define, configure, and monitor the devices to be polled. Also, with CA ecoMeter Gateway, users can define mappings between SNMP and Modbus/BACnet to any BMS devices and other types of equipment. New enhancements include:

• Perform auto discovery eliminating manual configuration of hundreds of devices and possibly hundreds of calculations

• Easy-to-use interface designed for fast deployments

• Template approach to setting up devices allows faster, mistake free deployments

• Support SNMP, MODBUS, and BACnet

**CA ecoMeter probe for SaaS deployment**

The new CA ecoMeter probe allows Nimsoft to receive data from the CA ecoMeter Gateway and provides a user interface for configuring and adding devices. To further simplify the configuration of devices the probe will include a set of out-of-the-box device templates. This new capability allows organizations to:

• Receive energy data from the CA ecoMeter Gateway to monitor energy data alongside equipment data

• Provide data from the gateway to the Nimsoft database

• Configure the polling interval from the CA ecoMeter Gateway

• Have full control by stopping, starting and restarting the probe at any time
Key benefits

CA ecoMeter provides energy management and power management for data centers and IT.

The CA Technologies advantage

From your buildings to the boardroom, CA ecoSoftware is a comprehensive solution for helping you address your energy and sustainability management needs. The CA ecoSoftware solution set includes three separate, but integrated products: CA ecoGovernance, a carbon and sustainability management solution, CA ecoMeter, an operational energy management solution, and CA ecoDesktop, a PC power management solution. CA ecoGovernance helps enable you to pursue a systematic and governed approach toward your energy, carbon, and environmental initiatives. It helps you execute your sustainability program more effectively to better deliver on your objectives. It also helps you to more effectively capture, report, and communicate your sustainability outcomes more effectively to stakeholders. CA ecoMeter captures detailed real-time information about energy use across your data centers and operational facilities, enabling you to better measure, trend, alert, and take action. It is designed to provide a baseline to help you reduce costs, make better use of capacity, and enhance operational reliability and performance, as well as deliver continuous information for ongoing improvement.

“CA ecoMeter’s real-time analytics and accurate monitoring enable informed decisions and a true reality check versus what many data center managers believe about how their data center operates today and how it could operate tomorrow.” Katherine Broderick, Sr. Research Analyst, Datacenter Infrastructure Management (DCIM): Redefining the World of Facilities and Cloud Computing, an IDC White Paper Sponsored by CA Technologies, September 2011