

POWER ASSURE DYNAMIC POWER MANAGEMENT

POWER ASSURE REDUCES DATA CENTER ENERGY CONSUMPTION BY UP TO 50% THROUGH AN INTELLIGENT SOFTWARE PLATFORM THAT AUTOMATICALLY ADJUSTS THE NUMBER OF SERVERS TO MATCH APPLICATION LOAD.

DYNAMIC POWER MANAGEMENT

As electricity becomes increasingly expensive due to accelerating demand and carbon emissions regulations, data center operators have less control over their energy costs. Power Assure's Dynamic Power Management (DPM) software allows you to balance the supply of compute power with the level of demand from customer applications. By increasing average utilization and optimizing the number of servers in use at any time, Power Assure can save up to 50% on your power bill.

REAL-TIME ENERGY ANALYSIS AND OPTIMIZATION

The Power Assure Management software module processes and analyzes power and application load data provided by its Power Monitoring software module. Our online database tracks key metrics for all of the assets in your data center, including power draw and service level requirements for your customers. The management software module continuously matches server supply with demand and service levels. The software can also adjust cooling systems (fan speed, water temperature, and water flow) to further reduce energy consumption. The platform operates in conjunction with standard load balancing and virtualization solutions that distribute application load across available servers.



Power Assure P100 Energy Controller

Both the monitoring and management software modules reside on the Power Assure P100 Energy Controller, provided and serviced by Power Assure. The 1U P100 energy controller supports up to 5,000 servers and is easily installed in a server rack at your data center or lab environment. Depending on the size of the data center, multiple controllers may be required. The Power Assure Web-based dashboard – customized for your data center – integrates and displays all facilities and IT power information to provide real-time energy use monitoring and management. The Power Assure software service can be hosted either at Power Assure's secure data center; or, if security requirements demand it, at your data center facility with Power Assure providing management and support.

SAAS BACK-END

Power Assure offers robust software as a service (SaaS) or hosted onsite deployments with the following features:

- Shared reference database (SaaS only) that contains information on data center equipment (servers, cooling units, power distribution systems), utility data (service levels, alerts, availability, outages, demand response requests and time-of-day pricing details), and other relevant information (outside temperature, network information, and emergencies)
- Simulation engine for trying out various changes to see the affect before you make changes
- Calculation engine that determines the optimal number of servers across all data centers for each customer application
- Core operational process management system that directs the dynamic management of servers using your own runbook models, integrating both IT and facilities information into the dashboard
- Per customer archive and inventory that stores the historic configuration, operation, and energy consumption and savings data of the data centers for up to 36 months. Power Assure provides fully auditable data for utility rebates where available.



POWER ASSURE

POWER ASSURE MANAGEMENT SOFTWARE SPECIFICATIONS

MANAGEMENT SOFTWARE MODULE

ELEMENT	DESCRIPTION
Monitoring Frequency	Once per minute or as needed per runbook process
Protocol Support	Ethernet/IP, BACnetEthernet, BACnet/IP, Modbus, Modbus/TCP, SNMP, GE-SRTP, DF1, BACnetMSTP, BACnetPTP, JBus, ModbusASCII, ModbusDaniels, ModbusOmniflow, ModbusRTU, ModbusTek-Air, and MetasysN2 Open
Environmental Data Collection	Temperature (inside and outside) and humidity

MONITORING SOFTWARE MODULE

ELEMENT	DESCRIPTION
Design Approach	Service level and application load-focused from rack to individual servers
Automation Functionality	Dynamic adjustment of server capacity based on application load, time-of-day, energy prices, and customer-defined events Dynamic adjustment of server shutdown, slowdown, sleep, and restart Spare capacity buffer defined by customer
Protocol Support	XML, HTTP, HTTPS, telnet, ssh, PHP, VBS, SNMP, IPMI, ILO, and command line scripts; other APIs on request

SAAS BACK-END

ELEMENT	DESCRIPTION
Process Models	Templates stored in central repository; can be shared and re-used; individual process models are stored for each customer's application
Process Model Execution	Self-healing management with re-distribution of tasks in case of temporary resource unavailability Automatic failover and automatic load balancing using multi-threaded modules Executed tasks logged centrally to create individual customer archives
Process Customization	Highly flexible and reusable. Process can include multiple applications, multiple resources, and people. Process can be nested, event-driven, and time-driven; can have sequential tasks, parallel tasks, loops, execution, and routing rules. Process can invoke scripts and applications, notify people (via pager and email), monitor events/systems, and trigger tasks/actions
Monitoring and Management Process Control	Modbus event handling: shutdown/startup/slowdown Load balancing services: add, remove, allocate, de-allocate servers Virtualization services: start, stop, migrate, monitor System management services: application status/load, system load, runbook execution
Utility Grid Status	Availability, alerts, and demand-response
Energy Pricing	Captured by utility company, zip code, and time-of-day
Data Archiving	Energy demand and savings measured each minute and stored for 36 months
User Administration	Login/access management with 10 user levels and grouping possibilities Branding support: customer header available
Multiple Company Support	Support for multiple isolated companies within one system and support for a hierarchy of companies enables hosting/ colocation providers to provide compartmentalized access to their customers
Available Extensions	Ping; HTTP status check; HTTP application execution; network port scan; event listener; Telnet script execution; SQL command execution (primarily used for MySQL/DB2 certified); Windows Command Line script execution; remote Windows service calls; SNMP event handling; time management; email/pager notification
Platform O/S and Database Support	Windows 7 (in test), Vista, Win2k, Suse Linux 9.x/10.x/11.x, Apache, MySQL, DB2-certified for IBM eSeries, iSeries, and zSeries
Security	HTTPS, SSL, VPN

P100 ENERGY CONTROLLER

ELEMENT	DESCRIPTION
Sizing Information	1U appliance can monitor up to 10,000 measurement points. Multiple appliances will be provided as needed.
Processors	2 Intel 5500 Series Processors
Chipset	Intel 5500/ICH10R
BIOS	32 Mb AMI SPI Flash ROM
Memory	8 GB
Drive	1 SATA hard drive
Network	2 Gigabit Ethernet ports
Physical	19-inch rack mountable Weight: 18 pounds Dimensions: 17.3 W x 1.7 H x 14.5 D inches
Cooling	Three 4-cm counter-rotating fans
Input Requirements	AC Input Voltage: 100-240 VAC Rated Input Current: 7A ~ 3A max (100-240V) Rated Input Frequency: 50 to 60 Hz

CUSTOMER POWER MANAGEMENT DASHBOARD

ELEMENT	DESCRIPTION
Core Functionality	Displays and manages power consumption, PUE, temperature, application load, application capacity, servers, and racks
User Interface	Flash/Flex 3.0 with XML/HTTP request support, dynamic content loading, integrated overlay management, and Web services SOA - Soap/XML: Service abstraction available for easy UI integration using JSON, Flash, XUL, and .NET Real-time graphic monitoring Adobe Air standalone dashboard optional Mobile phone support on demand
Web Portal Access	Real-time reporting and information access HTTPS access supported IE, Firefox, Safari, Opera, and Chrome compatible Micro-browser support on demand
Languages Supported	SaaS Back-end and Flash front-end currently available in English. Other UI languages available on request

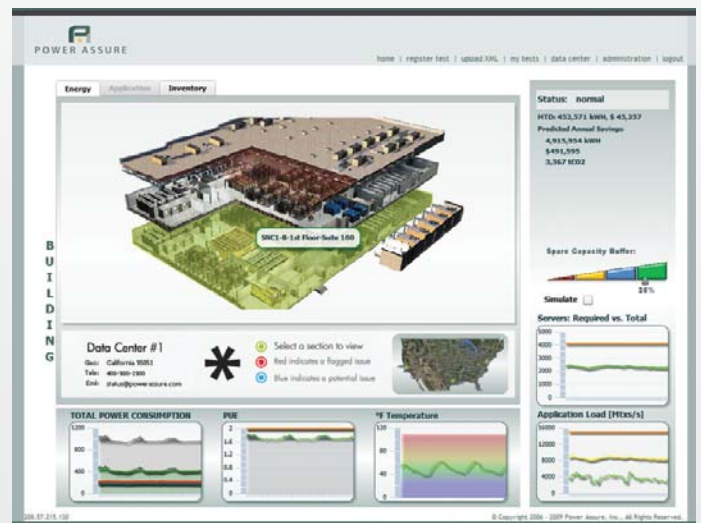


Figure 1. Customer Power Management Dashboard