

Entretiens Cartier, November 2012

Power management in virtual server environment

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Powering Business Worldwide

# Entretiens Cartier

## Power Management in virtual server environment

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### Summary

- Eaton Corporation
- Power Management Software suite
- Power management integration in Virtualization

# Powering businesses worldwide for 100 years

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- Founded in 1911 by J.O. Eaton
- World Headquarters in Cleveland, Ohio USA
- Regional Headquarters in Shanghai, China; Morges, Switzerland; Sao Paulo, Brazil
- Innovation Centers in the USA, China and India
- Customers in more than 150 countries
- 2010 sales of \$13.7 billion, 55% of sales outside the U.S.
- Approx. 70,000 employees
- Chairman & CEO –Alexander M. Cutler

# Eaton is a leader across the power management spectrum

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We provide reliable, efficient and safe power management for...



Cities & Buildings



Industrial & Machinery



Information Technology



Transportation



Infrastructure



Energy & Utilities

# Powering businesses worldwide for 100 years

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New high-pressure fuel injection system for the Airbus A380:  
**1 metric ton saved = CO<sub>2</sub> reduction**



TSI Superchargers for the VW/Audi group:  
**15% more power, 20% fuel savings**



Hybrid electric and hybrid hydraulic truck power:  
**60% fuel savings**



High efficiency data center UPS:  
**\$30,000 savings over 5 years**

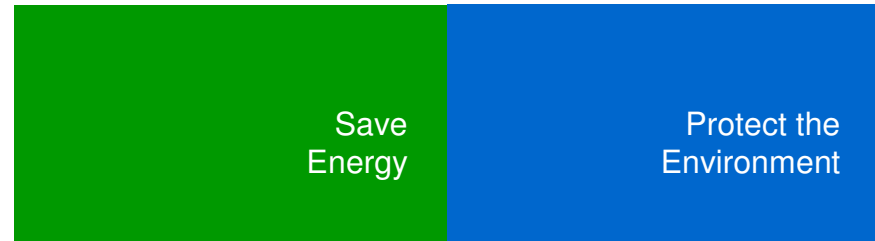
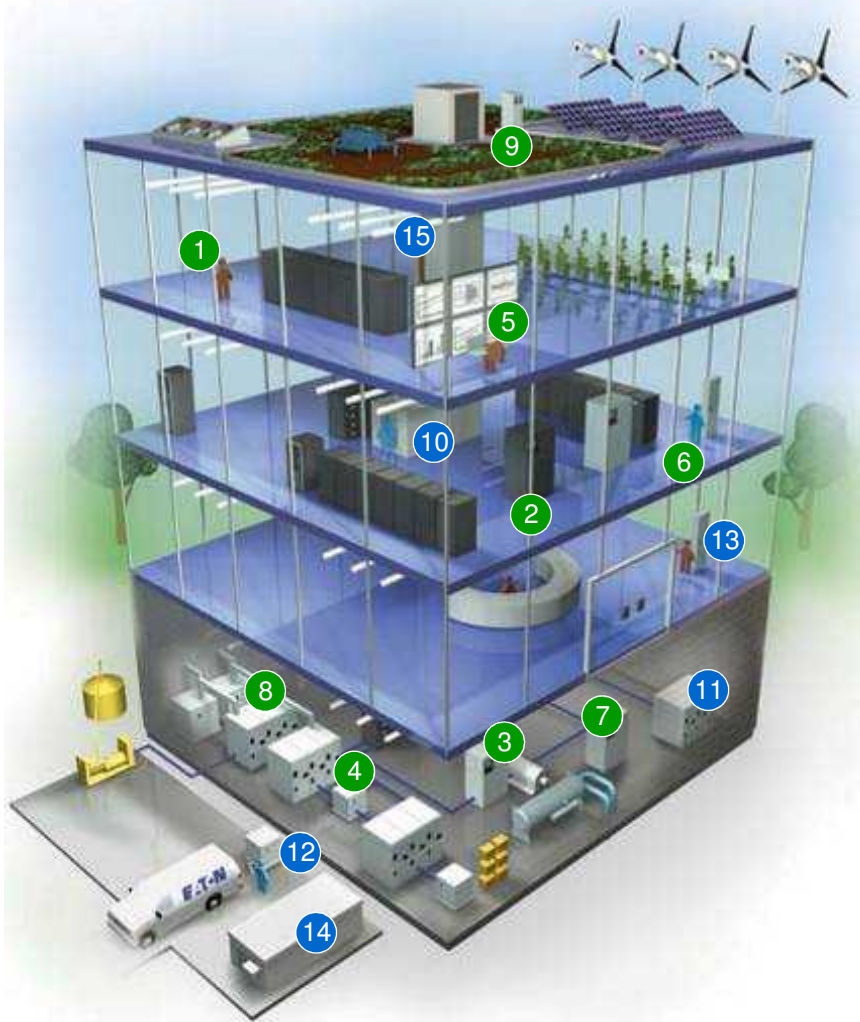
# From Power to Critical Infrastructure Management

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- Initial entry in the UPS (power quality) space: Powerware (2004)
- Extend power range outside of the USA
  - Phoenixtec (China); Santak = largest UPS brand in China
  - MGE Office Protection Systems (EMEA)
- Leading edge power management capabilities
  - MGE Office Protection Systems
- Strengthen service capabilities
  - Balmen (Spain), Power Products (Czech), PK Electronics (Belgium)
- Rack-based power distribution
  - Aphel (UK), Pulizzi (USA)
- Rack enclosures and air-flow management
  - Wright Line (USA)



# Eaton's electrical power solutions can help reduce energy usage by up to 30% in buildings



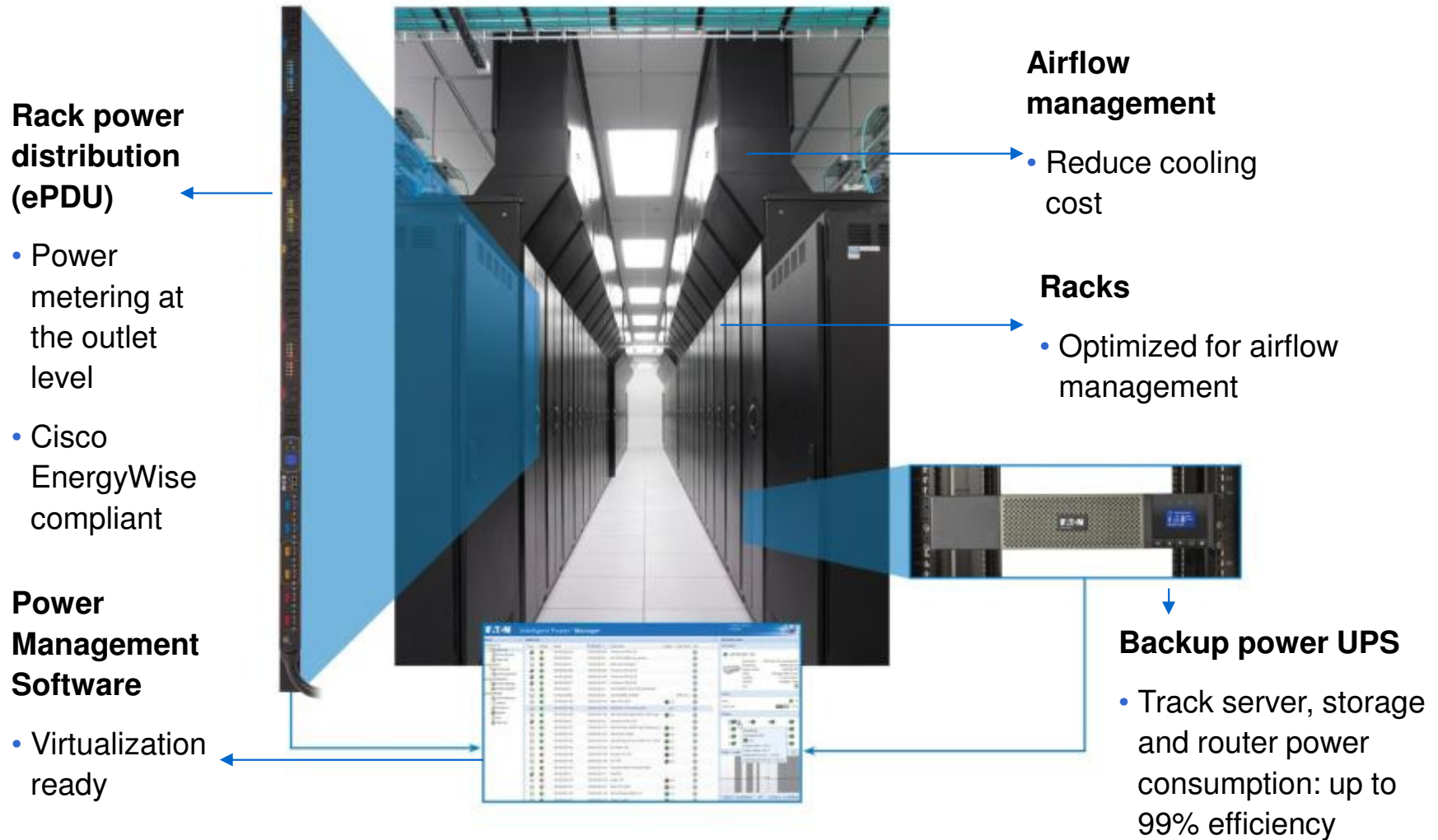
- |  |  |                                      |
|--|--|--------------------------------------|
| 1<br>Pow-R-Command<br>Lighting Control                           | 6<br>Energy Audits                                     | 11<br>Medium Voltage<br>Switchgear   |
| 2<br>Uninterruptible<br>Power Systems                            | 7<br>Power Factor Correction<br>Capacitors and Filters | 12<br>Refurbishing<br>Services       |
| 3<br>Variable Frequency<br>Drives and Soft Starters              | 8<br>Paralleling Switchgear                            | 13<br>Circuit Breakers               |
| 4<br>Energy Efficient and<br>Harmonic Mitigating<br>Transformers | 9<br>Automatic Transfer<br>Switches                    | 14<br>Integrated Power<br>Assemblies |
| 5<br>Power Xpert<br>Software and Meters                          | 10<br>Integrated Facilities<br>Systems                 | 15<br>Busway                         |



## Power Management Software Suite



# We have all the Physical Infrastructure -



# Products managed in Montbonnot HQ

## Single Phase UPS



Pulsar Series - Powerware Series - E Series

## Rack mounted 3 Phase UPS

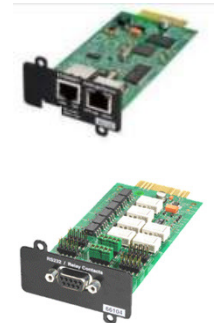
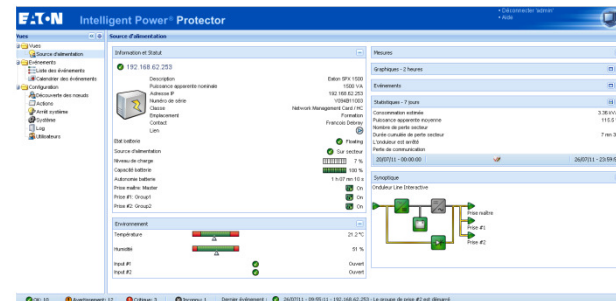


BladeUPS

## ePDU



## Software & Connectivity

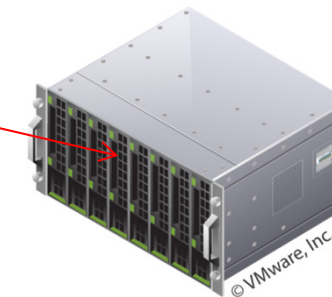


Critical Sales-enabler for IT Channels

# Intelligent Power Software Suite

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- Two software products
  - **Intelligent Power Manager:** software for extensive remote monitoring and management
    - Compatible with Windows PCs and servers; VMware's vCenter™; Citrix XenCenter and Microsoft's SCVMM
  - **Intelligent Power Protector:** shutdown software for extended power outages
    - Compatible with Windows, several versions of Linux; VMware's ESX™ and ESXi™; XenServer, RedHat KVM and Microsoft's Hyper-V™



# Intelligent Power Manager since 2009

## (Supervision and management)



- **Multiple OS** (from Windows 2000 to Seven)
- **Interface**
  - Web 2.0 Interface (Selective refresh, Drag and drop, ...) for Power source supervision, Graphs, Events, Calendar, Statistics, Customized Maps ...
  - Multiple languages (11 including Asian languages) & Multiple Browser (IE, Firefox , Chrome ...)
- **Installation**
  - Light weight package (easy installation without dependencies)
- **Nodes acquisition** (Network, USB, RS232)
  - Multi devices supervision (UPS & ePDU)
  - Multi-applications (IPP)
  - Automatic discovery
  - Redundancy supervision
- **Management**
  - ePDU Power measurement
  - Mass Configuration & Mass update & Automatic update
  - Flexible events and actions
  - Server and UPS Dependency
  - Simple asset management
- **Security**
  - Multi level password & https access

The screenshots illustrate the Intelligent Power Manager interface. The top view shows a list of nodes with columns for Name, Description, Location, and Status. The middle view shows a Node Map with a tree view on the left and a rack diagram on the right. The bottom view shows a Selection view for a specific device, displaying detailed information, status, and a graph of power usage over time.

# Intelligent Power Protector since 2010

## Server Graceful Shutdown



- **Multiple OS** (from Windows 2000 to Seven on x86 & x64 / Linux (native package)
  - Virtual environment (VM Ware, Hyper V, Xen, KVM)
- **Interface**
  - Web 2.0 Interface (selective refresh, Drag and drop, ...) for power source supervision, Graphs, Calendar, Statistics, ...
  - Multiple languages (11 including Asian languages) & Multiple Browser (IE, Firefox, Chrome, ...)
- **Installation**
  - Light weight package with easy installation (without dependencies)
  - Deployment facility (silent install)



- **UPS acquisition** (USB + RS232 + Network)
  - Automatic discovery
  - Redundancy
- **Manageability**
  - Mass Configuration & Update
  - Automatic update
  - Shutdown controller
  - Flexible events and actions
- **Security**
  - Shutdown alarm protection & ht





## Power management integration in Virtualization

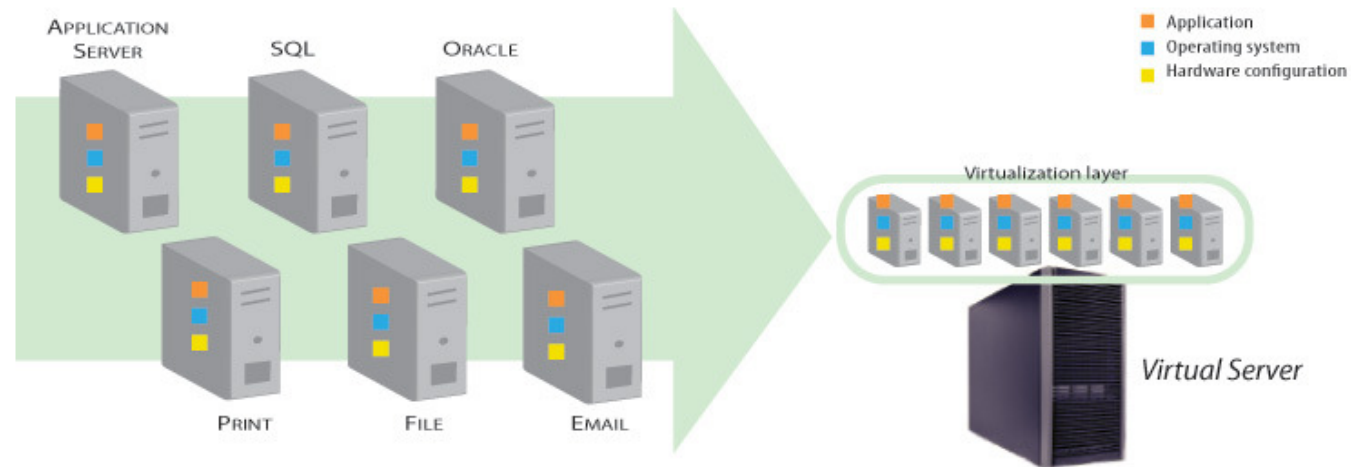


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# Virtualization

- What is virtualization ?

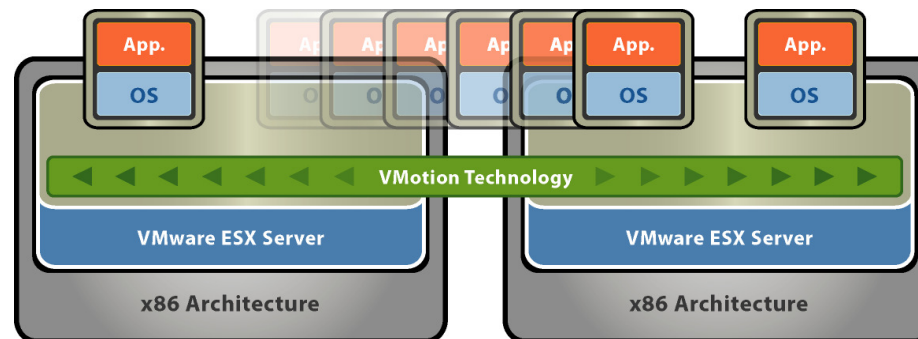


- Consolidation of IT applications on virtual machines instead of having dedicated servers per application
- Virtual machines are independant from physical servers

# Virtualization Increases business continuity

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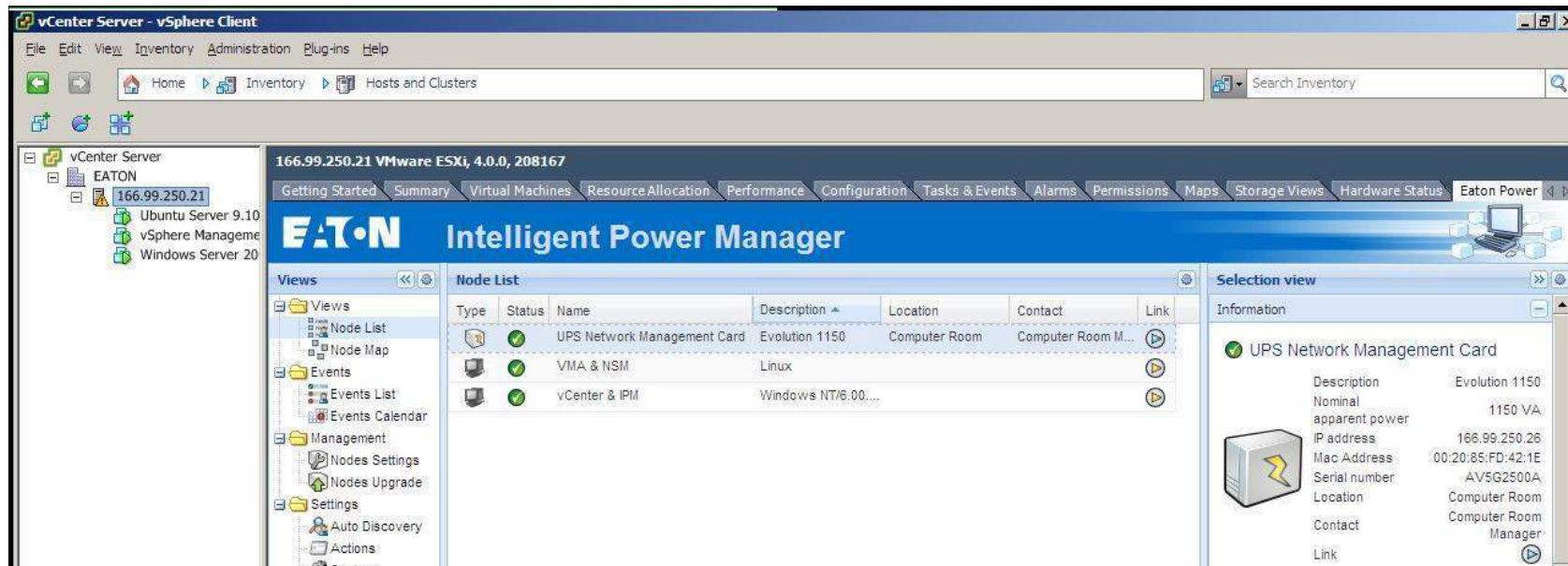
- The capability to move and balance the load (VMs)
  - vMotion on VMware
  - Live Migration on Microsoft
  - Xen Motion on Citrix XenServer
  - Live Migration on Redhat Enterprise Virtualization





# Power integration in IT Software (VMware)

- Register IPM as a Plug-In in vCenter
- Register new type of event (Power Event)
- Create new alarms triggered from events



# Power Event trig Alarms

The screenshot displays the VMware vCenter Intelligent Power Manager interface. The left sidebar shows a tree view of hosts, with 'sc07.support.eaton.com' highlighted. The main pane shows the 'Node List' with two entries for 'sc06.support.eaton.com' and 'sc07.support.eaton.com'. The right pane shows the 'Selection view' for 'sc07.support.eaton.com', including details like 'Description: VMware ESXi 5.0.0 build-469512', 'IP address: 166.99.226.17', and 'Power Source' information. At the bottom, the 'Triggered Alarms' table shows a critical alarm for 'sc07.support.eaton.com' with the message 'Host UPS PowerFailure (On Battery)' triggered on 07/11/2011 at 15:18:10.

Object	Status	Name	Triggered	Acknowledged	Acknowledged By
sc07.support.eaton.com	Alert	Host UPS PowerFailure (On Battery)	07/11/2011 15:18:10		

# Power integration in IT Software (Citrix)

The screenshot displays the XenCenter application window. The title bar reads "XenCenter". The menu bar includes "File", "View", "Pool", "Server", "VM", "Storage", "Templates", "Tools", "Window", and "Help". The toolbar contains buttons for "Back", "Forward", "Add New Server", "New Pool", "New Storage", "New VM", "Shut Down", "Reboot", and "Suspend". A "System Alerts: 125" notification is visible in the top right. The main content area is titled "Xen\_pool" and shows a tree view on the left with nodes for "XenCenter", "Xen\_pool", "IP69\_Master", "RHEL5\_64", "DVD drives", "Local storage", "Removable storage", "IP31\_Client", "RHEL5\_64 (1)", "DVD drives", "Local storage", "Removable storage", "DVD drives", "iSCSI virtual disk storage", "Local storage", "NFS ISO library", and "Removable storage". The main pane displays the "Intelligent Power Manager" interface, which includes a search bar, tabs for "General", "Memory", "Storage", "Network", "HA", "WLB", "Users", "Intelligent Power Manager", and "Logs", and a login form with fields for "Login:" (containing "admin") and "Password:", and a "Login" button. The page content includes the Eaton logo and the text "Intelligent Power Manager" and "What is Eaton Intelligent Power Manager?".

**EAT·N Intelligent Power® Manager**

**What is Eaton Intelligent Power Manager?**

- Ideal for monitoring and managing multiple power and environmental devices, Intelligent Power Manager software from Eaton delivers a global view across the network from any PC with an Internet browser.
- Exceptionally versatile, the software is compatible with any device supporting a network interface, including other manufacturers' UPSs, environmental sensors, ePDUs, shutdown applications and more.
- Intelligent Power Manager also offers the ability to organize a management table by groups, centralize alarms, and maintain event logs for preventive maintenance of the entire installed equipment base.

Login:   
Password:

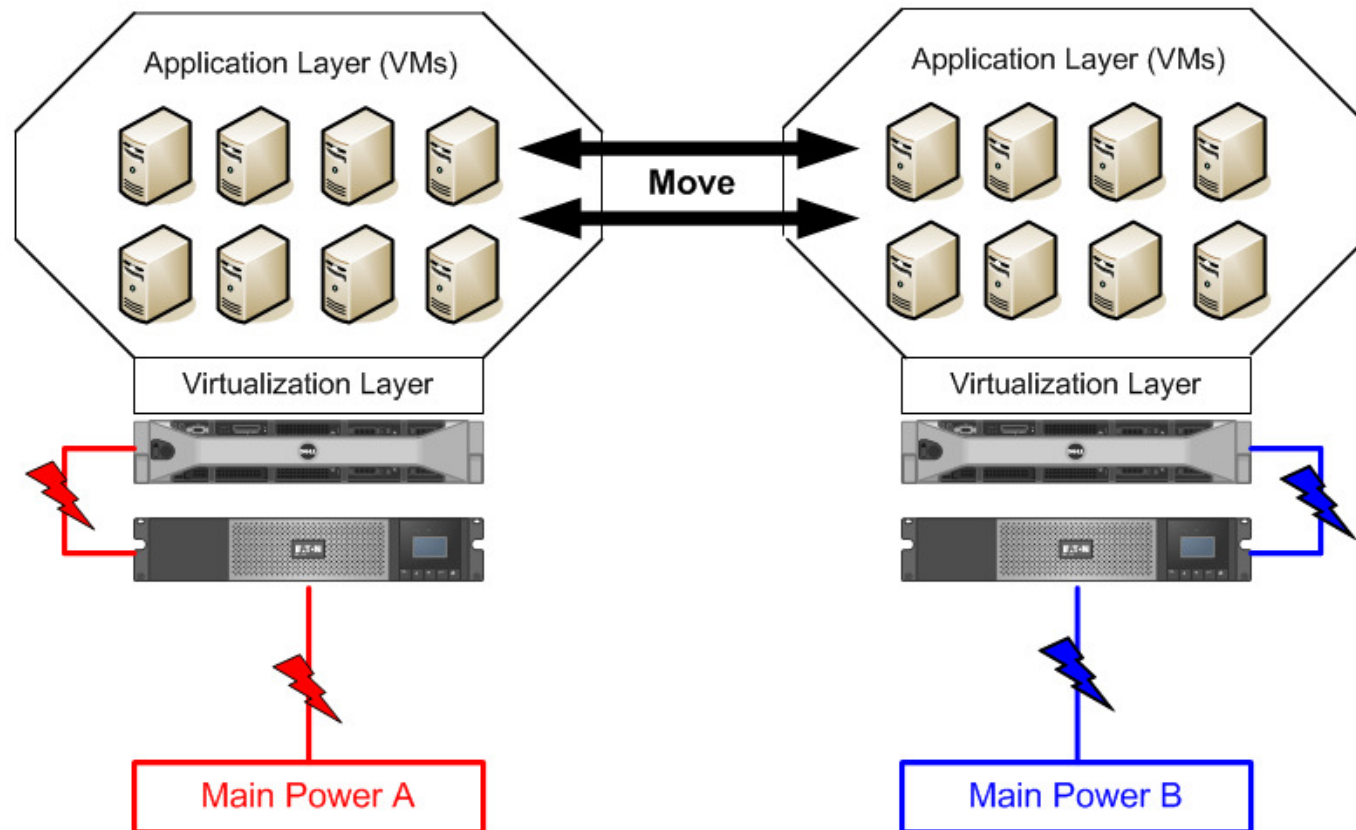
# The Power Protection

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- **Local** Protection Agent (IPP)
  - Closer to the server
  - Need to be installed on each server
  - Installation not always possible (VMware ESXi)
- **Remote** Protection and Management (IPM)
  - Network is critical for the protection
  - Single point of failure

# Before the Shutdown

- Move load (VMs) on safe place



# Demo : VCenter

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- [vCenter demo feb 2012.mp4](#)

# For more information

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- Learn more about the new Intelligent Power Software Suite and view the product demo at [www.eaton.com/intelligentpower](http://www.eaton.com/intelligentpower)



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