



**40**

# CRITICAL PROBLEMS

Your DCIM Should Solve

# How DCIM Helps Resolve data center management issues

## From 451 -

“A data center infrastructure management (DCIM) system collects and manages information about a data center’s assets, resource use and operational status.”

**DCIM tools that provide this information in a meaningful manner increase Data Center, IT and Facilities Management situational awareness, allows the Data Center Operator to make informed strategic operational decisions, and provides useful information for future investments and planning.**

In this eBook, we review the most critical problems faced by data center managers today, and how DCIM solutions provide real-time views of the data center environment, infrastructure assets and their associated power, space, and energy capacity to resolve these issues.



# Critical Problems



## Asset

- Easily locate assets in your data center from anywhere
- Know all there is to know about your asset
- Identify assets of a specific model type
- Easily identify physical network connectivity between devices
- Dramatically simplify data center audits
- Customize, save and email reports



## Capacity

- Monitor all breaker loads along the power path to maximize uptime
- Easily visualize real time space, power and data port capacity of all racks in your data center
- Improve power capacity planning and uptime
- Instantly know how much cabinet space you really have
- Quickly find available data center capacity to provision new equipment
- Automatically forecast when you are going to run out of power

# Critical Problems Continued

## Change

- Know the status of your tickets in real-time
- Know the impact change will have on your data center applications
- Understand the downstream impact of a potential change
- Ensure work quality

## Power

- Know power usage by rack/circuit
- Quickly identify power trends and spikes of individual servers
- Get real-time power analytics for your power chain
- Eliminate Ghost Servers and reduce Power Hogs
- Quickly restore service interruptions due to power outages
- Forecast power capacity needs
- Determine new data center power needs
- Identify and prevent potential power problems
- Maximize uptime with failover simulation analysis

# Critical Problems Continued



## Energy

- Monitor the amount of energy used for cooling
- Manage energy costs
- Promote sustainable energy reduction programs
- Drive corporate energy efficiency and sustainability initiatives
- Understand energy usage by customer, application, or other parameter
- Bill organizations based on actual energy usage



## Environment

- Easily monitor health of your data center infrastructure with a floormap birds eye view
- Ensure data center infrastructure equipment health
- Proactively identify hot spots and areas of risk for data center uptime
- Ensure real-time alerts and alarms are being addressed
- Improve cooling utilization strategies
- Ensure your servers are operating within the ASHRAE zone
- Monitor and set rack inlet temperatures to save money
- Automate carbon footprint reporting and trending



## **Easily Locate Assets** in your data center from anywhere

### **Problem:**

Lack of understanding where or what assets might be deployed in a data center.

### **Benefit:**

Gain an accurate real-time view of all facilities and IT components in your data center from virtually anywhere.





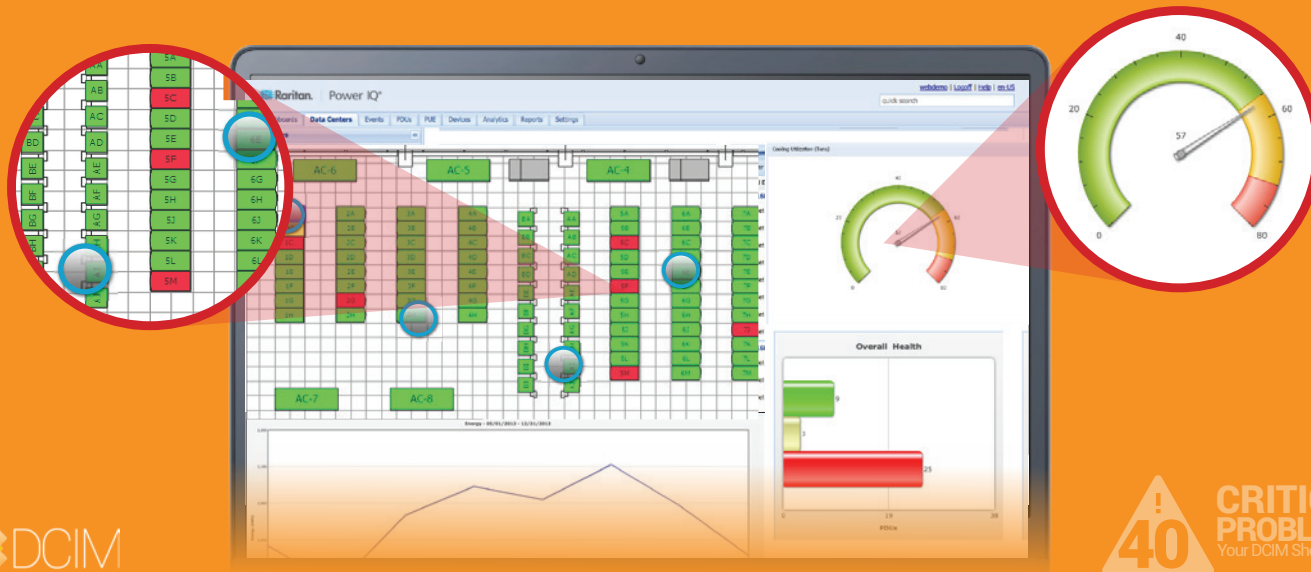
# Know All There is to Know about your asset

## ⚠ Problem:

Lack of detailed information about assets.

## 🎯 Benefit:

Easily visualize an asset, its location within the data center, its elevation and all specified details.





# Identify Assets of a specific model type

## Problem:

Unable to identify which servers belong to which department or which servers are of a specific brand/model.

## Benefit:

Use data attributes to create a list of items around a specific attribute.

– i.e. identify all HP servers that might be at risk due to a manufacturer's recall.

Location	Class	Subclass	Status	Name	Make	Model	Cabinet	U Position	Slot Position
SITE A	Device	Standard	Installed	ARCH01	HP	Proliant DL360 G5	4G	14	
SITE A	Device	Standard	Installed	ARCH01 ARRAY BOT	HP	StorageWorks MSA30	4G	10	
SITE A	Device	Standard	Installed	ARCH01 ARRAY TOP	HP	StorageWorks MSA30	4G	12	
SITE A	Device	Blade Chassis	Planned	BLADE-CHASIS1211	HP	Blade System c7000	1C	26	
SITE A	Device	Blade Chassis	Planned	BLADE-CHASIS29-651	HP	Blade System c7000	1C	14	
SITE A	Device	Standard	Installed	CLARITY	HP	Proliant DL360 G3	3F	1	
SITE A	Device	Standard	Installed	CLARITY03	HP	Proliant DL360 G3	2B	15	
SITE A	Device	Standard	Installed	CLS-NY04	HP	Proliant DL580 G2	2C	13	
SITE A	Device	Standard	Installed	CLS-NY04 ARRAY	HP	StorageWorks MSA30	2C	18	
SITE A	Device	Standard	Installed	CLS-NY05	HP	Proliant DL360 G3	2B	16	
SITE A	Device	Standard	Installed	CLS-NY05 ARRAY	HP	StorageWorks MSA30	2B	7	
SITE A	Device	Standard	Installed	CHSPROD ARRAY 1 BOT	HP	StorageWorks MSA30	3G	22	
SITE A	Device	Standard	Installed	CHSPROD ARRAY 2 TOP	HP	StorageWorks MSA30	3G	25	
SITE A	Device	Standard	Powered-off	CS005	HP	Proliant DL360 G3	4B	1	
SITE A	Device	Standard	Installed	CS008	HP	Proliant DL360 G4	4B	9	





# Easily Identify physical network connectivity between devices

## **⚠ Problem:**

Network path is not easily accessible at your fingertips.

## **🔗 Benefit:**

Restore service quickly by immediately knowing the physical connectivity of the network path.





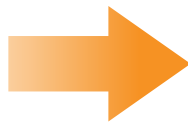
# Dramatically Simplify data center audits

## **Problem:**

Audits are time-consuming, complex, and waste paper.

## **Benefit:**

Perform an accurate, real-time assessment of your data center asset inventory through a centralized database with a mobile app.





# Customize, Save and Email reports

## **Problem:**

Inordinate amount of time spent creating reports due to lack of utilities and exposure to information.

## **Benefit:**

Provides users with the ability to get data for a specified time period in the format required. Ability to save, export, and email reports for further analysis. Ability to include external data from other data management resources via web services.





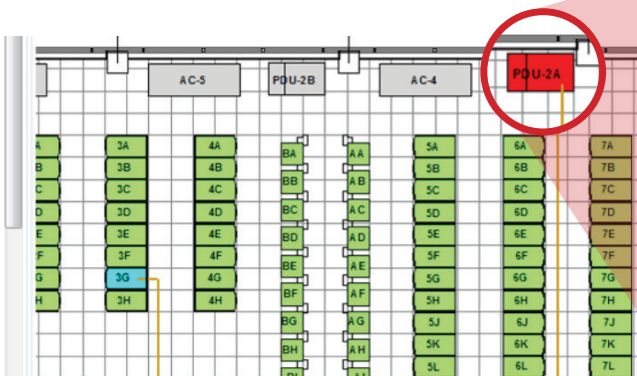
# Monitor All Breaker Loads along the power path to maximize uptime

## ! Problem:

Unable to monitor, set thresholds, and get alerts for all breakers in rack PDUs, floor PDUs, and panels and correlate the power chain power capacity.

## 🎯 Benefit:

Reduce downtime and save money as a result.



**PDU Information**

Name: PDU-2A  
 UPS Bank: A  
 Type: Panel Board  
 Function:   
 System Admin:   
 Admin Team:

**PDU Hardware**

Make: Liebert  
 Model: Precision Power  
 Serial No.: PCKR11-000  
 Asset Tag: 1374748  
 Purchase Date: 1/25/2007  
 Purchase Price: \$0.00

**PDU Specification**

Rating: 225 kVA  
 Input Breaker: 225 A  
 Input Voltage: 480 Vac  
 Front Clearance: 68 x 60 x 32 in.  
 H x W x D: 68 x 60 x 32 in.  
 Weight: 2700.0 lbs.

**PDU Status**

Enabled / Active

**Breaker Board Information**

Breaker Board Label	Type	Phase	Volts	Max. Amps	Phases	Actions
P01	Local	E00	225	225	Three-Phase (Wye)	Enable / Disable
P02	Local	L00	120	225	Three-Phase (Wye)	Enable / Disable
P03	Local	L00	120	225	Three-Phase (Wye)	Enable / Disable

**PDU Connected Load**

Per Phase: Refresh  
 Black (A): 9.95 kVA  
 Red (B): 6.18 kVA  
 Blue (C): 6.17 kVA  
 Total: 22.31 kVA  
 Current: 61.92 A

Consolidate Port: Probes  
 IP Address: Create Point

30,000 Cbs 909 SpPs 3,500 RUs 42% W/Pr 28.4 Load 100 kW 36 Tons  
 9.6% Devices 477 Cbs 78 0% BndF 20 kW/Cab 1.3 Supp 270 kW 120 Tons

Open Requests: 36 of 5 of  
 B Work Orders: 5 of



# Easily Visualize real time space, power and data port capacity of all racks in your data center

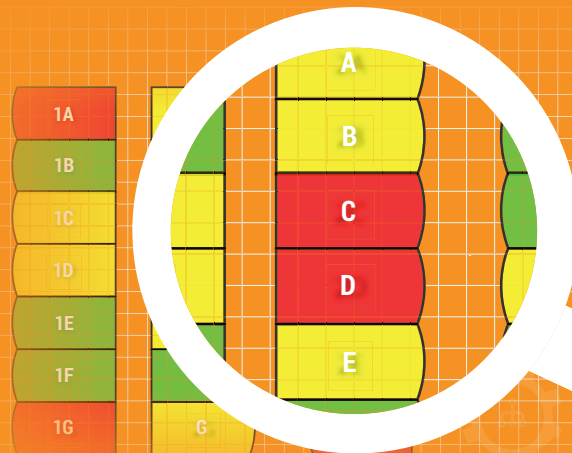
## **Problem:**

Difficulty understanding rack capacity, without being on site or using outdated Visio or Excel files which can sometimes be inaccurate.

## **Benefit:**

Save capacity planning time by easily visualizing real time capacity of all racks from wherever you are through a centralized database with a mobile app.

### Legend



# Improve power capacity planning and uptime

## **Problem:**

Unable to easily and quickly determine what cabinets have available capacity.

## **Benefit:**

Measure and plan usage based on cabinet level power consumption reports.

### Power Usage Per Cabinet



							Budget					
<b>Cabinet 1A</b>							Cabinet Totals					
Rack PDU 1A-RPDU-L							33	33	0	6.8	10	
Input Conn	Rating	24A	Max	30A	Volts	208	Amps	16	16	0	kW	3.4
Port Name	Amps	Connector	Legs	Item Name	Model	Port	Amps	Watts				
Output A06	16	IEC-320-C14	AB	NJESX04	Proliant DL360 G5	PS1	2.05	426				
Output A12	16	IEC-320-C14	AB	NJESX03	Proliant DL360 G5	PS1	2.05	426				
Output A15	16	IEC-320-C14	AB	NJESX13	Proliant DL360 G5	PS1	2.05	426				
Output A16	16	IEC-320-C14	AB	NJESX12	Proliant DL360 G5	PS2	2.05	426				
Output A17	16	IEC-320-C14	AB	NJESX11	Proliant DL360 G5	PS1	2.05	426				
Output A18	16	IEC-320-C14	AB	NJESX02	Proliant DL360 G5	PS1	2.05	426				
Output A23	16	IEC-320-C14	AB	NJESX05	Proliant DL360 G5	PS1	2.05	426				
Output A24	16	IEC-320-C14	AB	NJESX01	Proliant DL360 G5	PS1	2.05	426				

Amps	Watts
2.05	426
2.05	426
2.05	426
2.05	426
2.05	426
2.05	426
2.05	426
2.05	426
2.05	426
2.05	426



# Instantly Know How Much cabinet space you really have

## Cabinet Resources



### Cabinet 1B

#### Available Front Rails

.....26,27,28,29,30,31,32,35,36,39,42

#### Available Back Rails

.....26,27,28,29,30,31,32,35,36

Largest mounting space on Both rails: 7 Rack Units

#### Available Network Item Ports

	Color	Group/VLAN	Quantity
CLARITY20			36
			36
NEXUS			1
			1
<b>Cabinet Total</b>			<b>37</b>

#### Available Data Panel Ports

Connected	Qty	Connector	Color	Group
<input checked="" type="checkbox"/>	10	RJ45	Blue	PROD
<input checked="" type="checkbox"/>	10	RJ45	Gray	ADMIN
<input checked="" type="checkbox"/>	4	RJ45	Green	STOR
<input checked="" type="checkbox"/>	4	RJ45	Orange	STOR
<input checked="" type="checkbox"/>	10	RJ45	Red	PROD
<input checked="" type="checkbox"/>	10	RJ45	White	ADMIN

#### Available Power Ports

Connected	Qty	Connector	Color	Branch	Class
<input checked="" type="checkbox"/>	1	NEMA L6-30P	Blue		Power Outlet
<input checked="" type="checkbox"/>	1	NEMA L6-30R	Red		Power Outlet
<input checked="" type="checkbox"/>	1	IE C-320-C14	Red	Fuse A1	Rack PDU
<input checked="" type="checkbox"/>	1	IE C-320-C14	Red	Fuse A2	Rack PDU
<input checked="" type="checkbox"/>	4	IE C-320-C14	Red	Fuse A3	Rack PDU
<input checked="" type="checkbox"/>	2	IE C-320-C14	Red	Fuse A4	Rack PDU
<input checked="" type="checkbox"/>	3	IE C-320-C14	Blue	Fuse B1	Rack PDU
<input checked="" type="checkbox"/>	1	IE C-320-C14	Blue	Fuse B2	Rack PDU
<input checked="" type="checkbox"/>	4	IE C-320-C14	Blue	Fuse B3	Rack PDU
<input checked="" type="checkbox"/>	2	IE C-320-C14	Blue	Fuse B4	Rack PDU
<input checked="" type="checkbox"/>	1	NEMA L6-30P	Blue		Rack PDU
<input checked="" type="checkbox"/>	1	NEMA L6-30P	Red		Rack PDU
<input checked="" type="checkbox"/>	5	IE C-320-C14	Red	Fuse A1	Rack PDU
<input type="checkbox"/>	5	IE C-320-C14	Red	Fuse A2	Rack PDU
<input type="checkbox"/>	2	IE C-320-C14	Red	Fuse A3	Rack PDU
<input type="checkbox"/>	4	IE C-320-C14	Red	Fuse A4	Rack PDU
<input type="checkbox"/>	3	IE C-320-C14	Blue	Fuse B1	Rack PDU

## ! Problem:

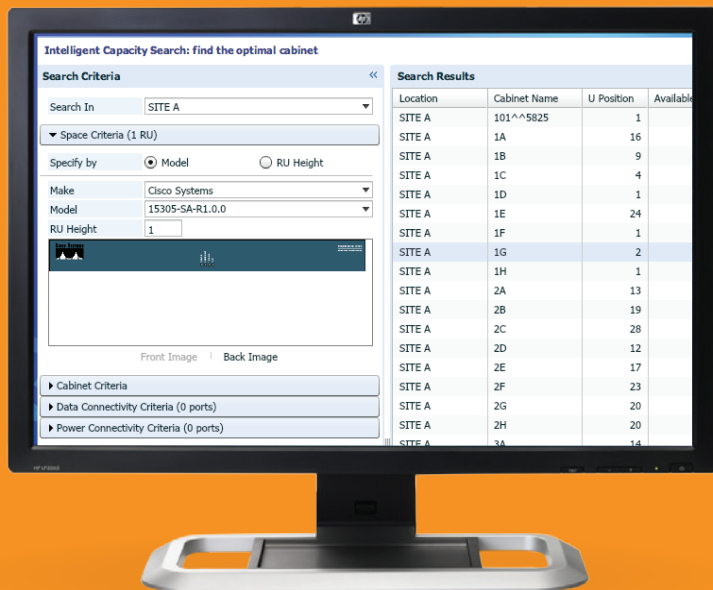
Inability to identify space availability without physically being there (due to lack of or inaccurate spreadsheets and information).

## ⚙️ Benefit:

Instantly and accurately see cabinet level capacity resource availability and determine if more services can be added to a given cabinet.



# Quickly Find Available Data Center Capacity to provision new equipment



## Problem:

Inability to figure out where to place new equipment when it arrives on the dock and if you have enough capacity without manual effort.  
– hunt/peck, traversing data center, inaccurate database files.

## Benefit:

Simple intelligent search to find available capacity (space, power and network connectivity) to quickly and accurately plan and reserve capacity.





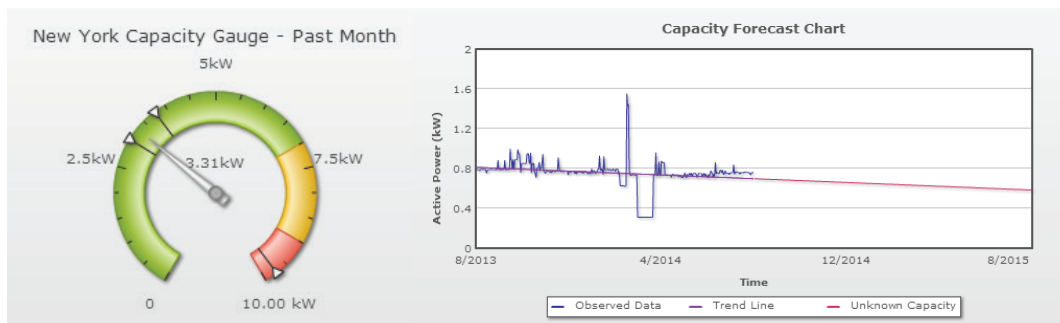
# Automatically Forecast when you are going to run out of power capacity

## Problem:

Unable to know when power capacity will run out and forecast expansion based on my historical equipment usage and power consumption rate .

## Benefit:

Dramatically improve your planning and know when you need to expand or purchase more





# Know the Status of your tickets in real-time

## **Problem:**

Inability to easily find out the status of work being done in the data center.

## **Benefit:**

Instant transparency with a listing of all planned, work in progress, and completed changes being made in the data center with audit trails.

Class	Item ID	Item Name	S/N	Action	Field	Old Value	New Value	Changed By	Changed On
Cabinet	1202	5A		UPDATE	Location Reference	(Blank)	R-24	admin	3/3/2013 8:57:21 PM
Cabinet	1202	5A		UPDATE	Type	(blank)	Cabinet	admin	2/28/2013 8:13:27 PM
Cabinet	1202	5A		UPDATE	Purchase Date	(blank)	Thu Feb 28 00:00:00 EST 2013	admin	2/28/2013 8:13:27 PM
Cabinet	1202	5A		UPDATE	Project Number	(blank)	dcTrack 3.0 GA386	admin	2/28/2013 8:13:27 PM
Cabinet	1202	5A		UPDATE	Installation Date	(blank)	Thu Feb 28 00:00:00 EST 2013	admin	2/28/2013 8:13:27 PM
Cabinet	1202	5A		UPDATE	Row Label	(blank)	5	admin	2/28/2013 8:13:27 PM
Cabinet	1202	5A		UPDATE	Position in Row	0	1	admin	2/28/2013 8:13:27 PM
Cabinet	1202	5A		UPDATE	Model	(blank)	48RU-Cabinet GlobalFrame-3A	admin	2/28/2013 8:13:27 PM
Cabinet	1202	5A		UPDATE	Alias	(blank)	DCT3-1	admin	2/28/2013 8:13:27 PM
Cabinet	1202	5A		UPDATE	Chassis Face	(blank)	North	admin	2/28/2013 8:13:27 PM



# Know the Impact changes will have on your data center applications

## **Problem:**

Inability to easily find what servers host what applications and who the owners are.

## **Benefit:**

Enables troubleshooting and impact analysis to changes within the data center.

### Applications



Application	Server name	App. Criticality	App. Admin	Customers	App. Sites
<b>Advanced Port Scanner v1.2</b>	CLARITY	Business Grade	,	Engineering,Marketing	
<b>dcTrack</b>	ARCH01 ARRAY TOP		,	Accounting	
	CLARITY	Critical	,	Accounting,Marketing	JC, NYC
	NJD12TEST01	Critical	,	Engineering,IS,Marketing	JC
<b>Email</b>	ARCH01 ARRAY TOP		,	Accounting,HR	
	CLS-NY04		,	Accounting,Engineering,Marketing	JC
<b>LiveUpdate 3.3 (Symantec Corporation)</b>	NTA-SERVER-1	Critical	,	Biosoftware	
<b>Web</b>	CLARITY	Essential	,	HR,IS	NYC
	CLS-NY05	Critical	,	Marketing,Sales	JC
<b>Windows Small Business Server Fax Cfg</b>	NTA-SERVER-1	Business Grade	,		



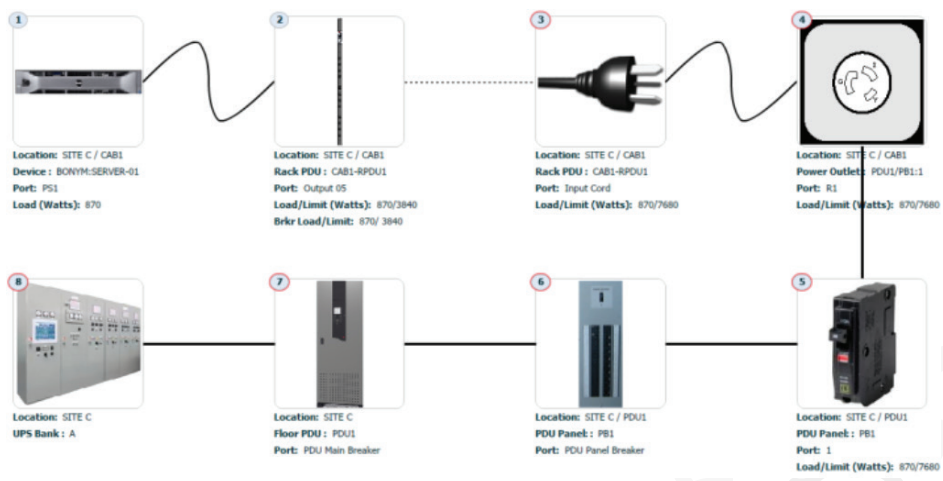
# Understand the Downstream Impact of a potential change

## Problem:

Inability to quickly identify asset dependencies and know what (critical) assets would be in jeopardy if there was a failure or a change.

## Benefit:

Provides advanced warning and enables alternate or remedial planning scenarios.





# Ensure Work Quality

## Problem:

Missing or inaccurate information in work orders or manual steps delays job completion with quality.

## Benefit:

Verification and validation of all information prior to approval reduces workflow delays and bottlenecks.

The screenshot shows the Raritan dcTrack interface. A modal window titled 'Process Add Item Ticket - Read-only' is open, displaying a comparison tool for ticket TKT008. The ticket description is 'Add Dell/2161D5'. The tool compares 'Original Ticket Data' with 'Matched/Corrected Data' and 'Field Rejected' data. The 'Matched/Corrected Data' table shows the following information:

Field Name	Original Ticket Data	Matched/Corrected Data	Field Rejected
Location	SITE BA	SITE B	
Item Name	NM032	NM03A2	
Class	Device	Device	
Subclass	Rackable	Rackable	
Item Status	N/A	Installed	
Item Request Stage	N/A		
Make	Dell	Dell	
Model	21605	2161D5	
Cabinet	1A	N01	
U Position	18	18	

Below the comparison tool, there is a 'Row Label' section and a 'Item Ports Information in Ticket' section. The interface also shows a list of 'Item Archival' records on the right side.



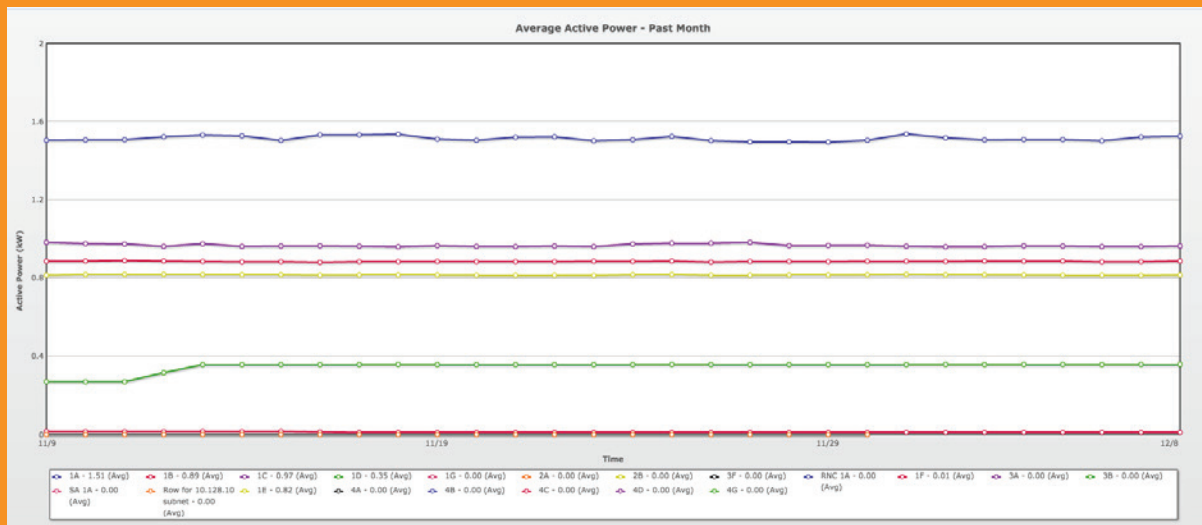
# Know Power Usage by rack/circuit

## ⚠ Problem:

Understand power usage to avoid paying over-usage / premium charge.

## ⚙ Benefit:

Rebalance power usage to avoid additional cost.





# Quickly Identify power trends and spikes of individual servers\*



## Problem:

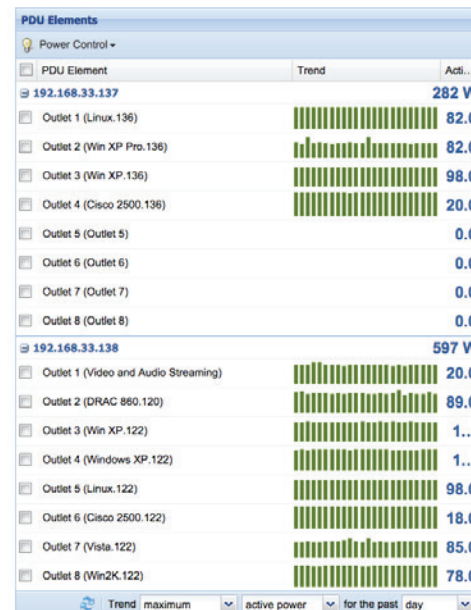
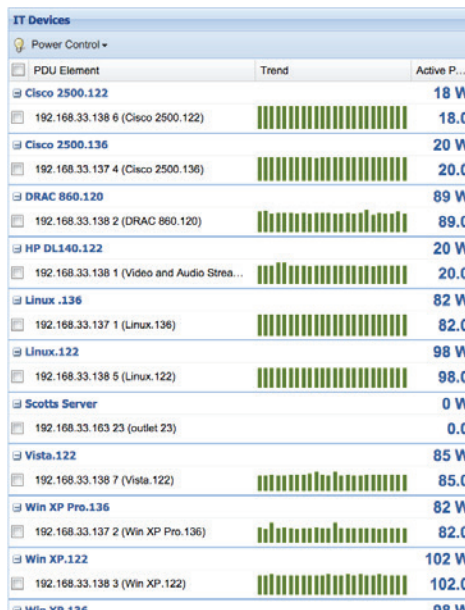
Difficulty in adding up all the power being consumed by multiple power supplies within a server



## Benefit:

Reduce risks to tripping circuit breakers due to over-provisioning

\* requires Raritan PX outlet level metering PDUs or third party





# Get Real-Time Power Analytics

for your power chain

## ⚠ Problem:

Unable to troubleshoot issues in your power chain and understand what drives your UPS

## ⚙ Benefit:

Dramatically reduce the troubleshooting time when you have incidents in your power chain



specifications

		Nameplate Sum		Budget Sum		Measu
Line	Volts	Power (kW)	Current (Amps)	Power (kVA)	Power (kW)	Curr (Amps)
L1	480	240.65			120.89	70
L2	480	231.68			115.60	65
L3	480	226.94			113.09	70
Power/High Amps		195.75	240.65	97.82	97.82	120.89

\* From 41 of 47 downstream measurements.

Metrics

Nameplate Ratio 50%      Load Power Factor 1.00

Location





# Eliminate Ghost Servers and reduce Power Hogs



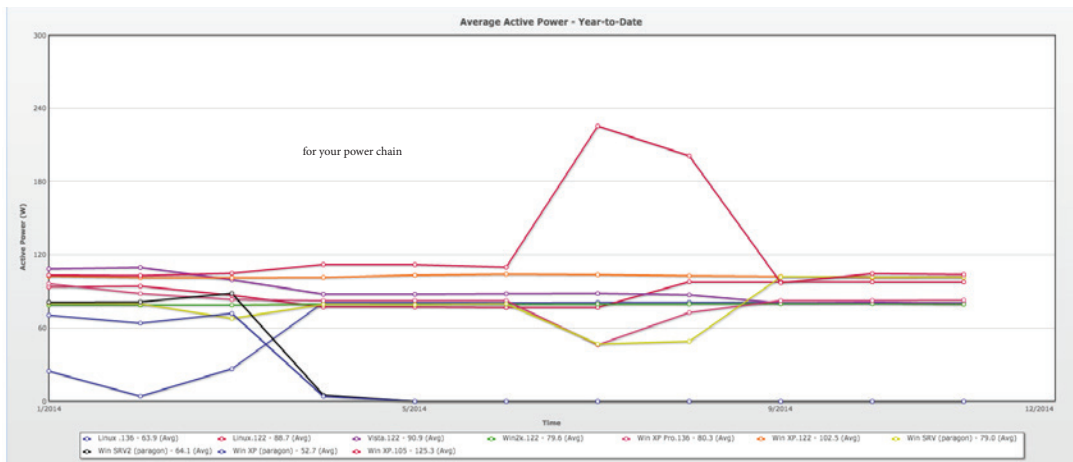
## Problem:

Inability to identify power consumption by server.



## Benefit:

For servers that are not in use, gain significant energy savings by switching off or transitioning to low power modes. Identify power hogs and switch to more efficient servers or virtualization.





# Quickly Restore Service Interruptions due to power outages



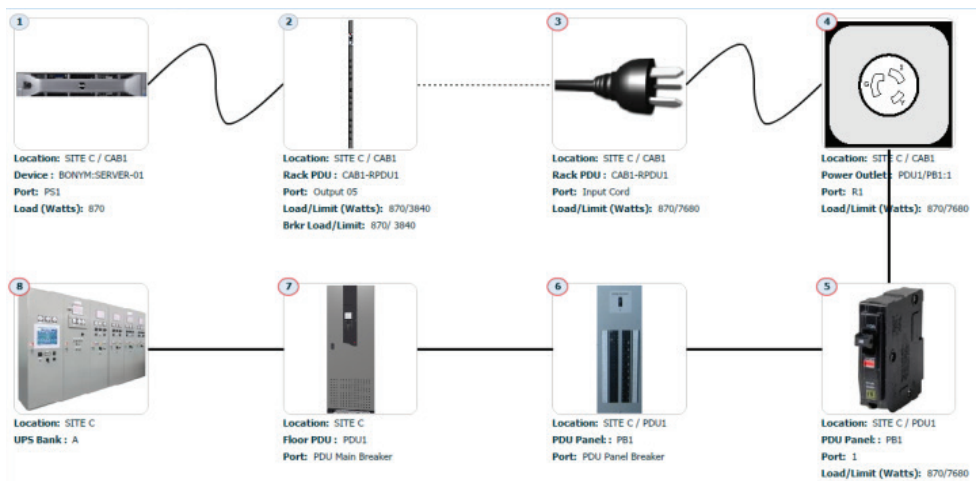
## Problem:

Inability to quickly identify asset dependencies and potential failure points.



## Benefit:

Ability to locate root cause and mitigate power issues quickly. e.g. if the power to the UPS failed, the server at Site C will be inoperable.





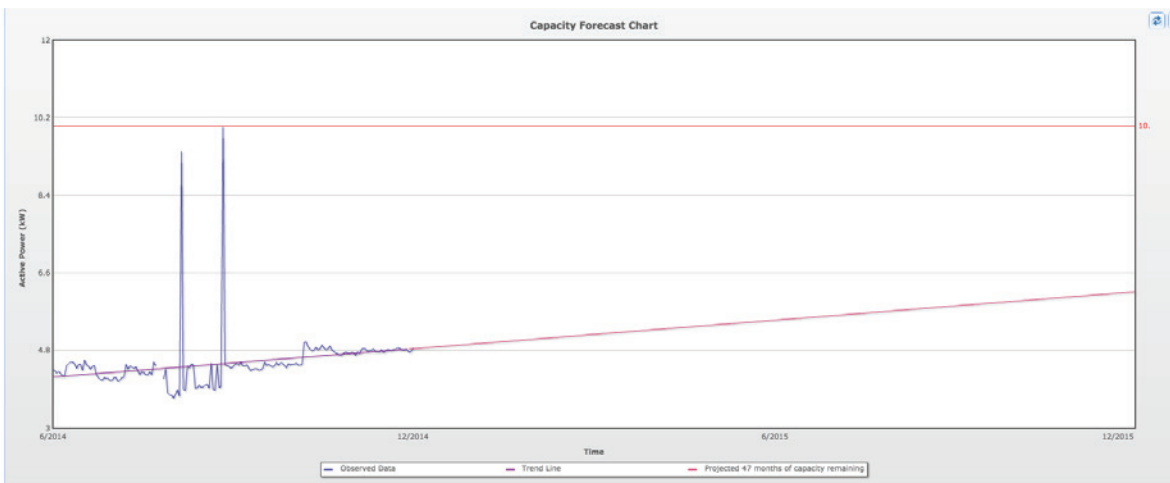
# Forecast power capacity needs

## **Problem:**

Difficulty gaining visibility as to when new space, power, cooling or connections may be needed.

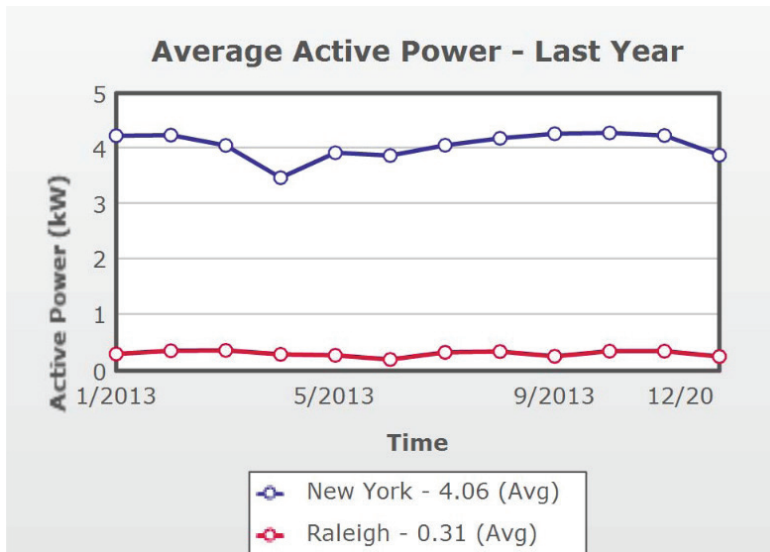
## **Benefit:**

Monitor trends over time to forecast when you need to order more capacity.





## Load balance data center power needs



### **⚠ Problem:**

Lack of understanding power capacity across multiple data centers.

### **⚙ Benefit:**

Maximize uptime and service delivery, while minimizing potential costs



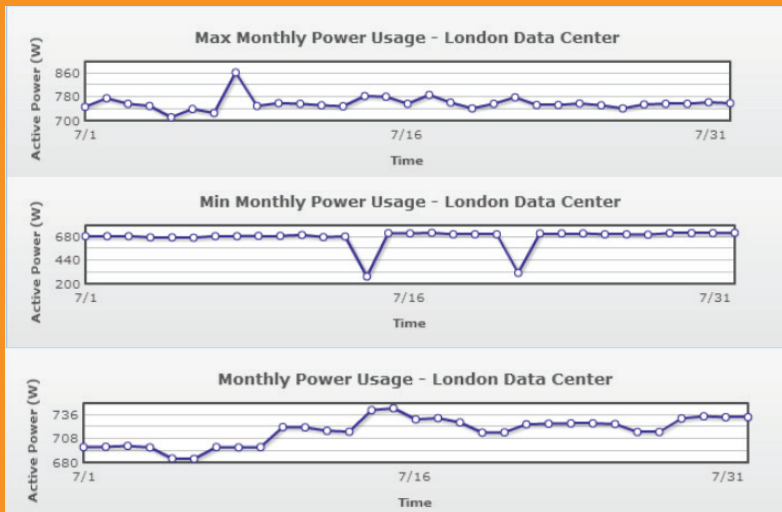
# Identify and Prevent potential power problems

## ! Problem:

Lack of visibility causes unnecessary downtime.

## ⚙️ Benefit:

Use trends to quickly identify spikes (time/day, day/week) and trends to maximize uptime.





# Maximize Uptime with failover simulation analysis

## **Problem:**

Lack of knowledge regarding whether a specific redundancy strategy will be successful.

## Failover 1st Floor

## **Benefit:**

At a glance view that shows whether there are enough resources to handle a potential failover, and thereby eliminate outage concerns.

**Date Range:** 2014/11/20 – 2014/11/20  
**Location:** 1st Floor

### Rack C

	Capacity (A)	192.168.43.105 Raritan PX2-5146R		192.168.43.63 Raritan PX2-1147R		Failover Simulation	
		Load (A)	Utilization	Load (A)	Utilization	Load (A)	Utilization
<b>Inlet</b>	16	0.40	2.5%	0.40	2.5%	0.80	5.0%
<b>Highest Utilization:</b>						<b>0.80</b>	<b>5.0%</b>



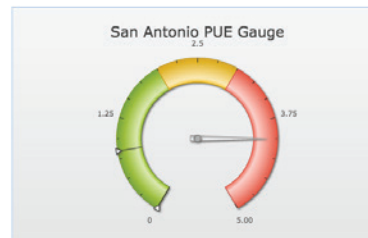
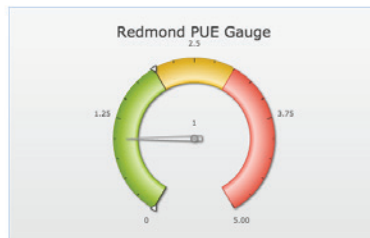
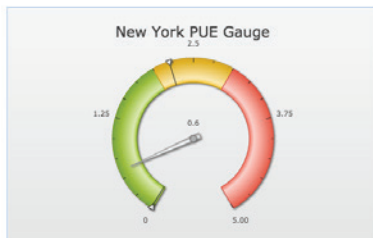
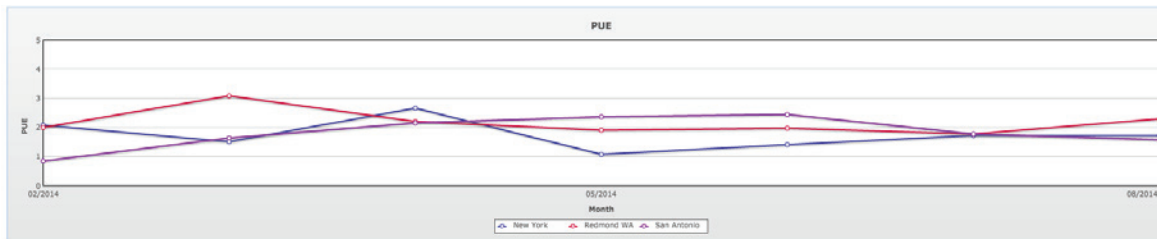
# Monitor Real-Time PUE across all data centers

## ⚠️ Problem:

Difficulty in tracking PUE of a data center over time or comparing the efficiency trends of multiple data centers with manual methodologies.

## 🔗 Benefit:

Automates the tracking and accuracy of PUE readings.





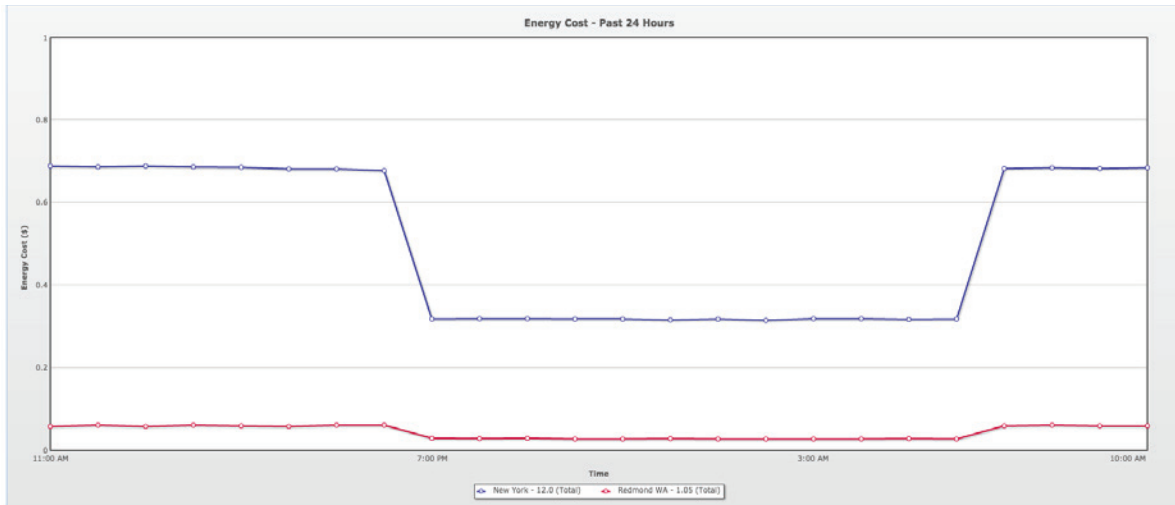
# Manage Energy Costs

## ⚠️ Problem:

Challenging to quickly identify and compare energy costs by data center, site, room, customer, application, or other parameter.

## 🎯 Benefit:

Drive energy reduction programs across data centers.







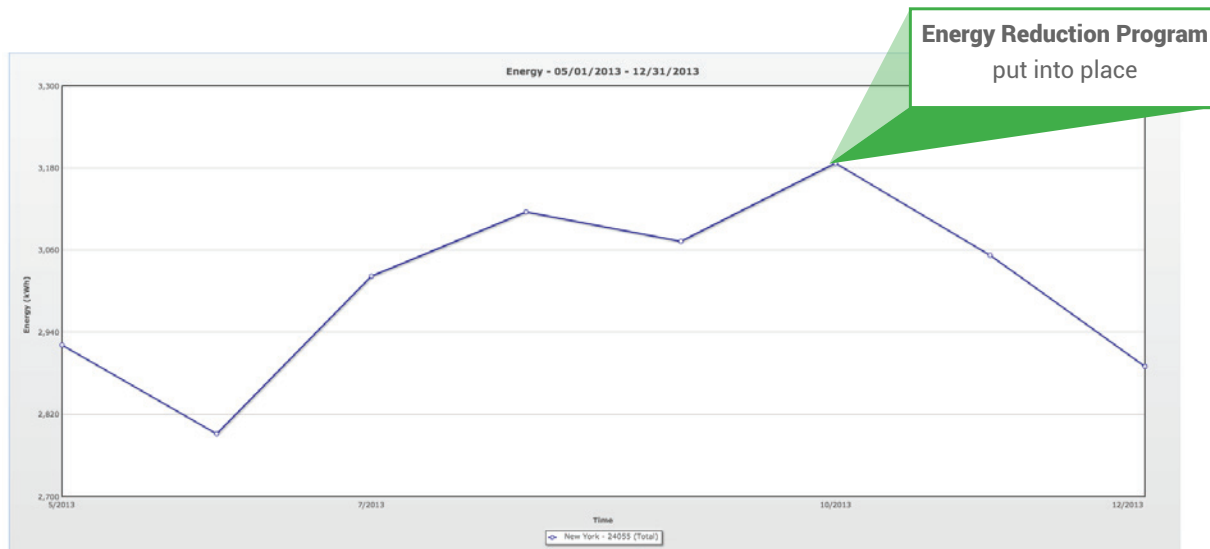
# Promote sustainable energy reduction programs

## **Problem:**

Track and see the results of energy efficient programs.

## **Benefit:**

Drive energy efficient behavior and ensure objectives are being met.





# Drive corporate energy efficiency and sustainability initiatives

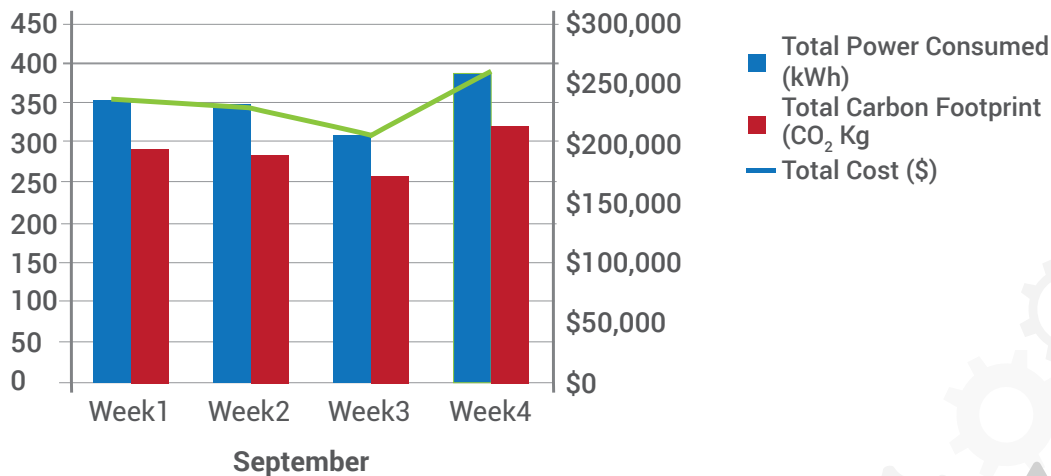
## **Problem:**

Inability to enforce initiatives due to lack of information on actual energy consumption.

## **Benefit:**

Drive energy reduction programs and/or shift loads accordingly

San Jose Data Center





# Understand Energy Usage by customer, application, or other parameter



## Problem:

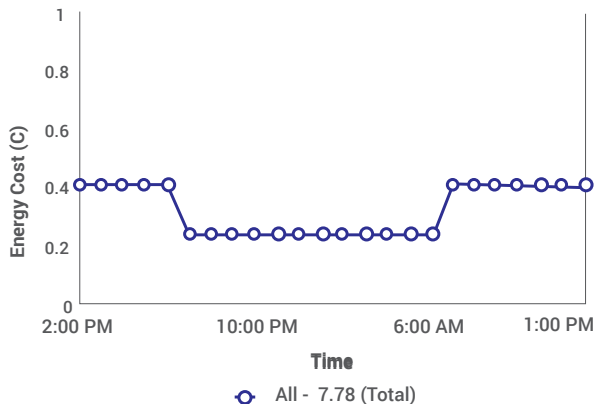
Difficulty to drive customers to be more energy efficient.



## Benefit:

More effective billing to drive energy efficiency and sustainability initiatives.

Energy Cost - Past 24 Hours



Raritan.

Reported: 2014/12/08 09:38 PM

## Energy by Customer (PDU)

Date Range: 2014/11/01 - 2014/11/30

Customer (PDU)	kWh	Avg kW
Bank of Petoria	865.671	0.618
Commercial Banking	595.223	0.413
Goldman's Pharmacy	233.598	0.324
Goldman's Pharmacy Inc.	127.963	0.183
Investment Banking	197.570	0.282
Online Banking	100.432	0.143
Pawterschmitt Industries	595.223	0.413



# Bill Organizations based on actual energy usage

## Problem:

Unfair customer billing (via allocation vs. usage) due to lack of understanding of actual energy usage.

## Benefit:

Enables the equitable distribution of power and energy charges.

Eliminates the need for the Data Center to carry the full burden for all power costs. Costs are divided by usage vs. allocations.

**Energy by Rack**  
Date Range: 2014/11/08 - 2014/12/07

**Energy by Department**  
Date Range: 2014/07/01 - 2014/07/31

Application (IT device)	kWh
Engineering	2945.509
Help Desk	
HR	
Marketing	8.109
R & D lab	537.642
Sales	0.000

	kWh	Avg kW	Rate (.06/kWh)	Energy Cost
Customer (PDU)	854.582	1.149	\$0.06	\$51.27
Bank of Petoria	257.655	0.346	\$0.06	\$15.46
Commercial Banking	8.109	0.011	\$0.06	\$0.49
Customer D	264.991	0.356	\$0.06	\$15.90
Goldman's Pharmacy	103.335	0.139	\$0.06	\$6.20
Clever Insurance	182.924	0.246	\$0.06	\$10.98
Investment Banking	106.44	0.143	\$0.06	\$6.39
Online Banking	537.642	0.723	\$0.06	\$32.26
Pewterschmitt Industries	689.834	0.927	\$0.06	\$41.39
Quahog Colo Facility	485.748	0.653	\$0.06	\$29.14
Retail Banking				



# Monitor the Amount of Energy used for cooling

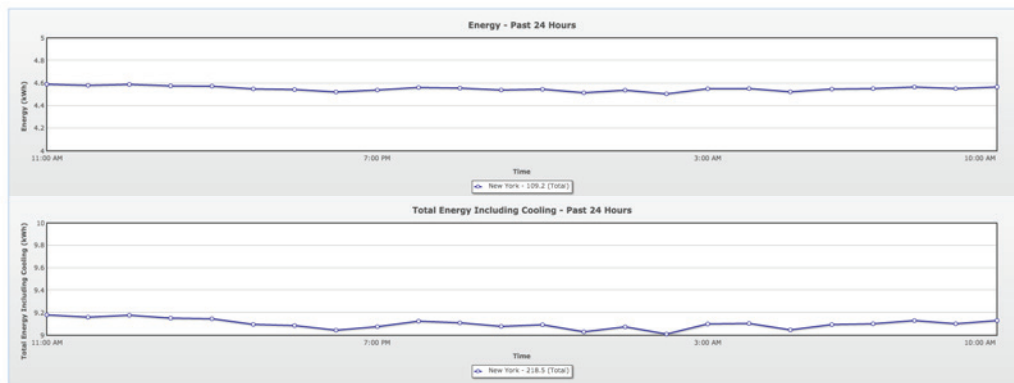
## ⚠ Problem:

Lack of knowledge on how much kWh the cooling system is consuming and the associated costs.

## ⚙ Benefit:

Make decisions on tactics to take to reduce cooling consumption, energy and costs, including:

- Increased chilled water temperature
- Modularization
- High efficiency chillers
- Water-side economizer
- Controlled optimization (staging, resets, etc.)



# Easily Monitor the Health of your data center

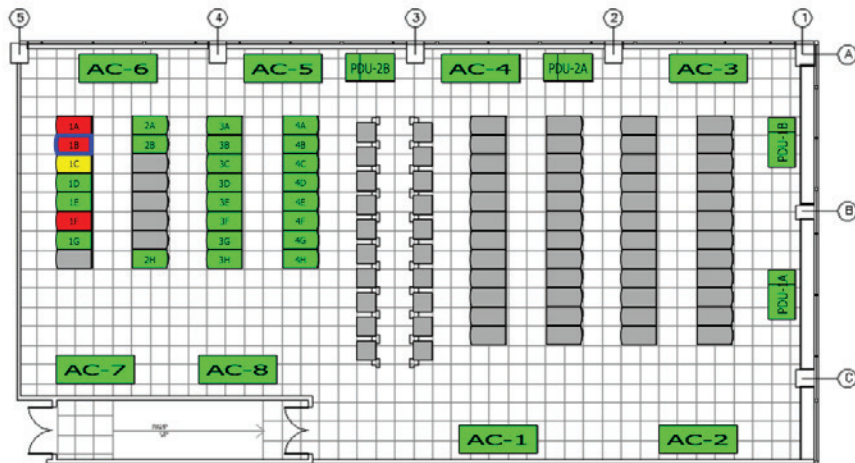
## **Problem:**

Difficulty in understanding the health of your data center infrastructure.

## **Benefit:**

Use one solution to see power and temperature threshold violations and identify appropriate action.

Health Map — New York



Legend

- Critical
- Warning
- Normal
- No Data

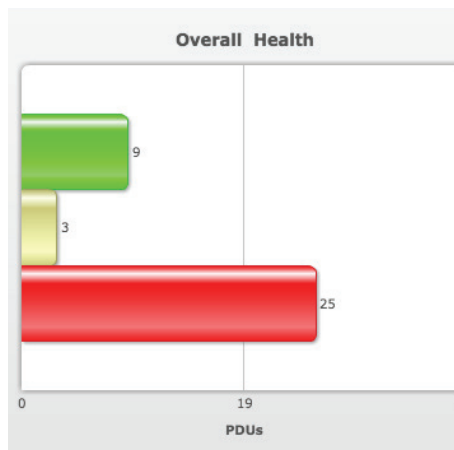
# Ensure data center infrastructure equipment health

## **Problem:**

Unable to easily identify trends/patterns in alerting over a period of time for analysis.

## **Benefit:**

Single view of alarm history through active polling enables the identification of data center items that might have underlying problems.



Occurred at	Severity	Event	Summary	Target
12/09/14 12:15:0...	Critical	<a href="#">Active power over critical t...</a>	Active power value of 0.97...	<a href="#">1C</a>
11/11/14 02:56:2...	Critical	<a href="#">Connectivity lost</a>	Loss of connectivity detect...	<a href="#">10.128.10.150 - 3</a>
11/06/14 02:15:0...	Warning	<a href="#">Inlet over voltage</a>	Inlet I1: voltage is over wa...	<a href="#">192.168.33.163</a>
10/10/14 02:43:3...	Warning	<a href="#">Admin credentials invalid</a>	Admin credentials failed to...	<a href="#">192.168.33.162</a>
09/26/14 10:15:0...	Critical	<a href="#">Active power over critical t...</a>	Active power value of 1.30...	<a href="#">1A</a>
09/09/14 03:12:0...	Warning	<a href="#">Inlet over current</a>	Inlet I1: current is over wa...	<a href="#">192.168.33.163</a>
08/21/14 05:34:1...	Critical	<a href="#">Connectivity lost</a>	Loss of connectivity detect...	<a href="#">192.168.33.130</a>
08/04/14 02:30:0...	Critical	<a href="#">Active power over critical t...</a>	Active power value of 0.75...	<a href="#">1B</a>
08/04/14 01:37:4...	Warning	<a href="#">Inlet under current</a>	Inlet I1: current is under w...	<a href="#">192.168.33.162</a>
07/07/14 09:50:2...	Warning	<a href="#">Admin credentials invalid</a>	Admin credentials failed to...	<a href="#">192.168.33.138</a>

# Proactively Identify hot spots and areas of risk for data center uptime

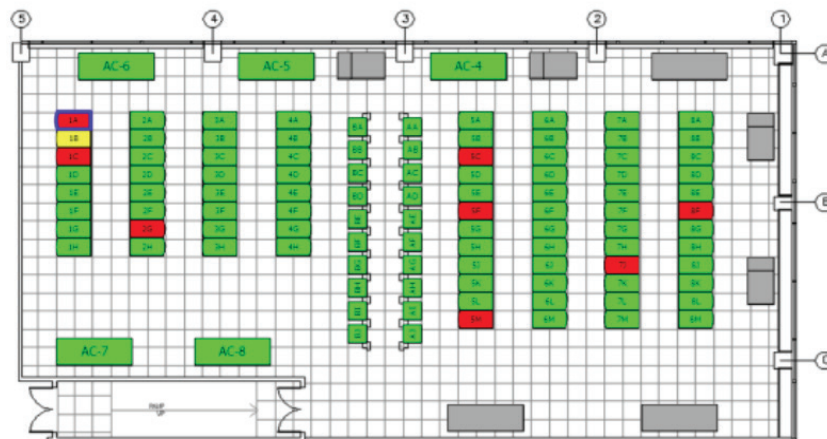
## ⚠️ Problem:

Inability to easily identify “hot spots” in the data center- areas in which thresholds have been exceeded

## 🔍 Benefit:

Visualization and information guide (actions/improvements) for rack/cabinets that are “hot.”

Health Map — San Jose



### Legend

- Critical
- Warning
- Normal
- No Data



# Ensure real-time alerts and alarms are being addressed

## **Problem:**

Lack of insight into problems and their potential resolution before they become critical.

## **Benefit:**

Ensure that real-time monitoring and consolidation of alarms from various data center infrastructure equipment are addressed.

Occurred at	Severity	Summary	Target	Status
12/09/14 07:35:00	Critical	Active power value of 0.939kW exceeds 70% of ...	1C	Active
12/09/14 04:42:11	Informational	Active power value of 1.533kW exceeds 90% of ...	1A	Active
12/08/14 11:46:21	Critical	Outlet "outlet 23" power state was changed to on	192.168.33.163	Active
11/11/14 02:51:04	Warning	Loss of connectivity detected at 11/11/14 01:51:...	10.128.10.150-3	Active
11/06/14 02:15:04	Warning	Inlet 11: voltage is over warning threshold	192.168.33.163	Active
10/23/14 09:55:45	Informational	Outlet "outlet 19" switched on by <snmp>	192.168.33.163	Active
10/22/14 02:00:49	Informational	Outlet "outlet 27" switched off by admin	192.168.33.163	Active
10/22/14 02:00:49	Informational	Outlet "outlet 26" switched off by admin	192.168.33.163	Active
10/22/14 02:00:49	Informational	Outlet "outlet 25" switched off by admin	192.168.33.163	Active
10/22/14 02:00:49	Informational	Outlet "outlet 24" switched off by admin	192.168.33.163	Active
10/22/14 02:00:49	Informational	Outlet "outlet 22" switched off by admin	192.168.33.163	Active
10/22/14 02:00:49	Informational	Outlet "Outlet 21" switched off by admin	192.168.33.163	Active
10/22/14 02:00:49	Informational	Outlet "outlet 20" switched off by admin	192.168.33.163	Active
10/22/14 02:00:49	Informational	Outlet "outlet 18" switched off by admin	192.168.33.163	Active
10/22/14 02:00:48	Informational	Outlet "outlet 17" switched off by admin	192.168.33.163	Active
10/22/14 02:00:48	Informational	Outlet "outlet 15" switched off by admin	192.168.33.163	Active

# Improve cooling utilization strategies

## **Problem:**

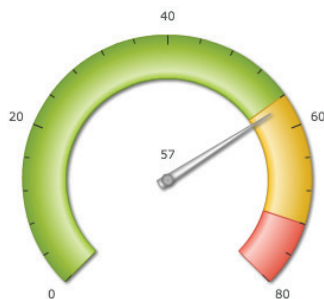
Inability to compare installed cooling capacity to heat load drives additional capacity purchases and masks cooling utilization problems.

## **Benefit:**

Ability to determine cooling infrastructure utilization and potential gains to be realized by airflow management improvements.

- environment improvements, reduced operating costs, and increased server utilization

Cooling Utilization (Tons)





# Ensure Your Servers are Operating within the ASHRAE zone

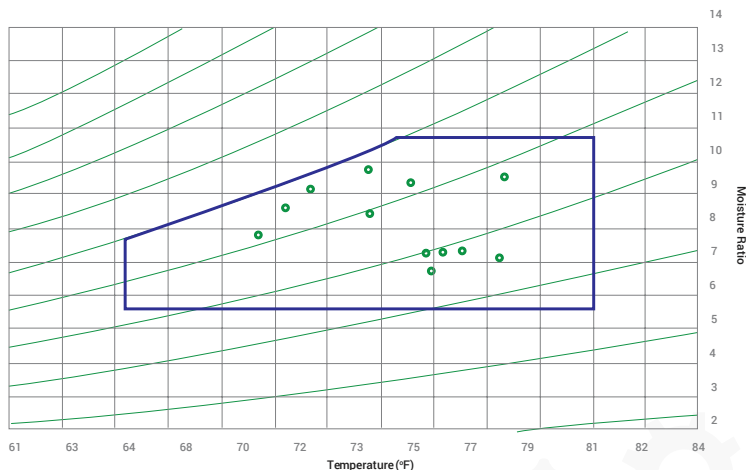
## Problem:

Easily identify which racks are in or out of the thermal envelope – ASHRAE safe zone.

## Benefit:

Easily see 1000's of temperature / humidity points from 100's of racks, know whether you have an environment that is safe to operate computer devices, and adjust accordingly.

Cooling Chart - Raleigh Data Center Inlet



Potential Cooling Energy Savings: 12%



# Monitor and Set Rack Inlet Temperatures

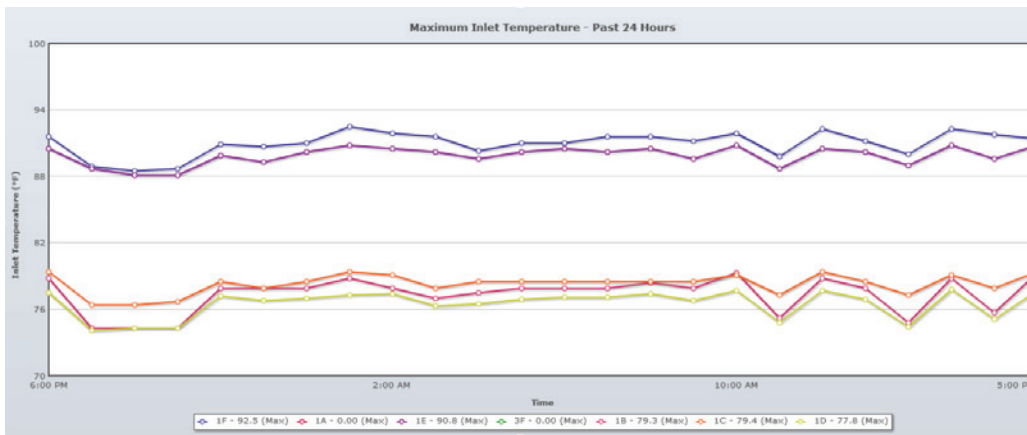
to save money

## Problem:

Lack of knowledge on rack temperatures leads to overcooling.

## Benefit:

Visualization of max inlet temperature trends in multiple racks, rows, or data centers enables better forecasting of cooling.



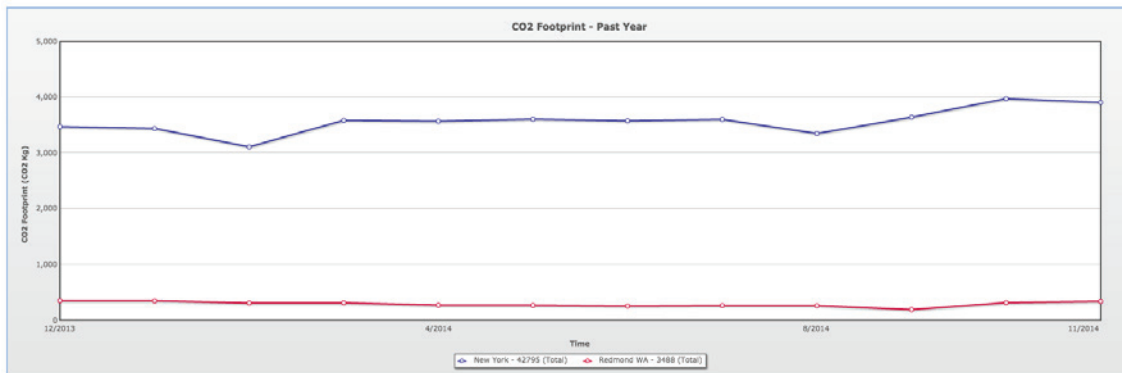
# Automate carbon footprint reporting and trending

## Problem:

Difficult, manual effort to calculate carbon footprint. Need to know carbon factors, kWh and frequently calculate and update.

## Benefit:

Automatically compare CO2 usage (Carbon Footprint) over time and develop strategies to reduce it to protect the Earth's climate.



## Summary

- ❖ DCIM is broad and can solve many problems. Even more than the ones identified here.
- ❖ Each customer situation is going to be different - pick and choose what problems you are trying to solve first and why you want to solve them.
- ❖ Reports, analysis and situational awareness allow Executives, Data Center Operator, IT and Facilities Managers to work together to make effective and actionable decisions today as well as forecasting and budgeting for the future.
- ❖ On the next page are some additional resources to help start your path down the DCIM purchasing process.



# Take Action Now

Talk to your colleagues and schedule a demo together to see how Raritan's DCIM meets each of your needs.



## ROI Calculator

Use our ROI Calculator to calculate your savings TODAY

[ROI CALCULATOR](#)



## Take a Test Drive

Test Drive Raritan's DCIM now to get the insight you need to better manage your data center

[TEST DRIVE NOW](#)



## On Site Assessment

Request an on site assessment and comprehensive summary report with a Raritan DCIM expert

[SCHEDULE NOW](#)