RACKWISE®

Solution Overview

DCiM X™

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Kirk Roderick - Principal SE

v1.5

Agenda

- Introductions
- Rackwise & Our Customers
- Market News – DCIM Growing
- Product & Technology Overview
- Intel & Rackwise Partnership
- Demonstration
- Reports
- Summary and Next Steps



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The Company – Rackwise, Inc.

- Founded in 2007
- Headquarters
  - Folsom, California
- Offices
  - Raleigh, North Carolina
  - Atlanta, Georgia
  - Boston, Massachusetts
  - Chicago, Illinois
  - Dallas, Texas
  - Los Angeles, California
- Products and Services
  - Data Center Infrastructure Manager (DCiM)
  - DCiM X SaaS (Software as a Service)
- Mission
  - Continue as the leader in progressive innovations for data center infrastructure management





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Customers



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Enterprise Customers



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Enterprise Customers



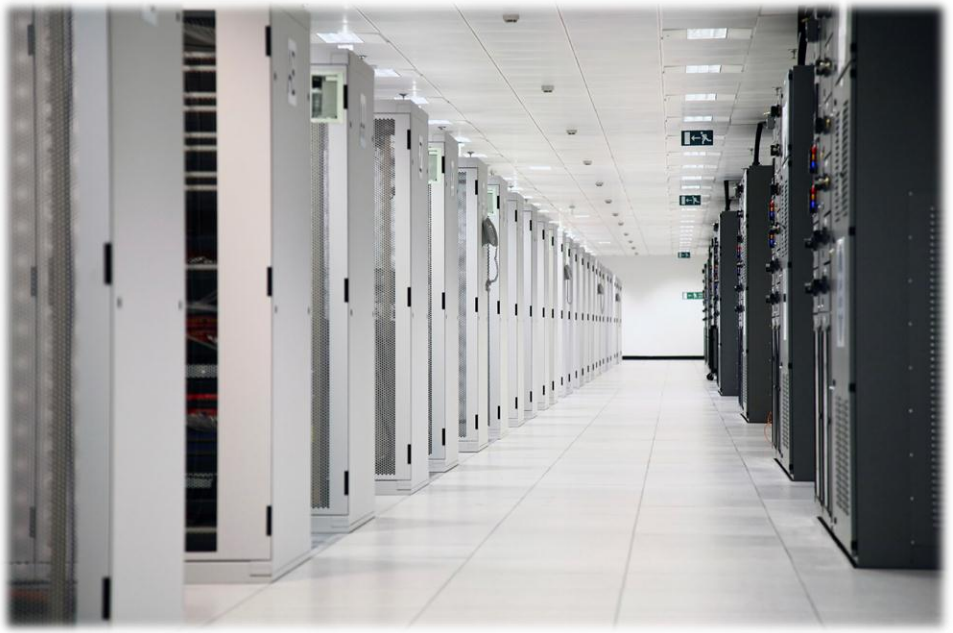
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Data Center Infrastructure Management (DCIM)

DCIM is defined by technology researchers and analysts as the integration of information technology (IT) and facility management disciplines to centralize monitoring, visualization, management, optimization and intelligent capacity planning of a data center's critical systems.

98% of all Data Centers are still using manual processes, spreadsheets and Visio diagrams. Extremely inefficient, i.e.; lack of asset visualization, energy and thermal management.

Rackwise DCiM provides the engine to drive greater *return on investment* from the Data Center.



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DCiM – What "they" are saying

- 451 Research, a Division of The 451 Group

  December 2011 451 Group research report, "Data Center Technologies Sector Topic: DCiM Software"

  …this [DCiM software] market will experience a 39% CAGR over the next 5 years…

- Gartner

  March 2010 Gartner report, "DCiM: Going Beyond IT"

  …market will grow from 1% penetration in 2010 to 60% in 2014…

  …energy savings from well-managed Data Centers can easily reduce operating expenses by as much as 20%...

- EPA

  June 2008 The Hot Aisle report**, "**Data Center Costs are Enormous**"**

  …Data Center carbon emissions will quadruple by 2020…

- U.S. Department of Energy

  October 2008 DOE report , "Data Center Energy Efficiency Program"

  *…with only **a 10%** improvement of overall energy efficiency in Data Centers, equivalent to electricity consumed by 1 million U.S. households annually…*

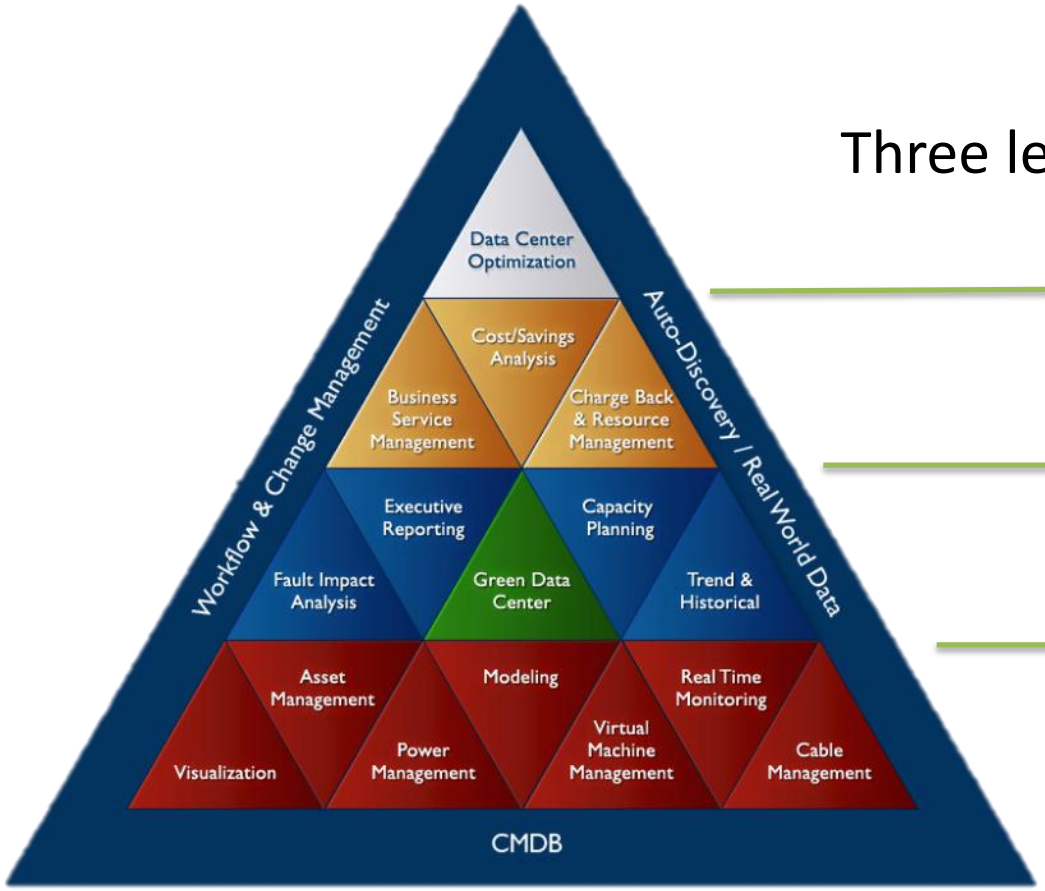
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Product & Technology Overview



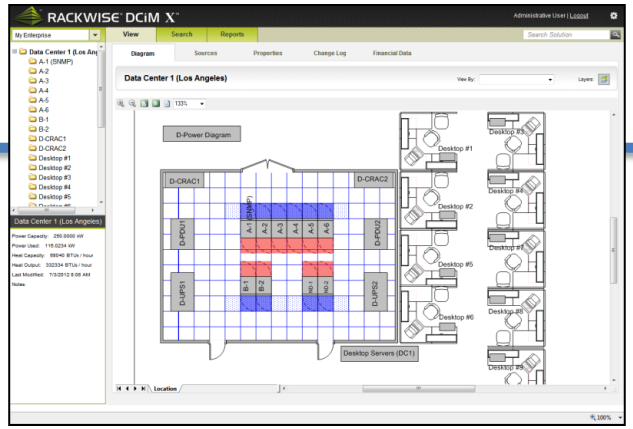
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Product Overview



Three levels of value – one product

- Data Center Business
- Data Center Intelligence
- Data Center Essentials

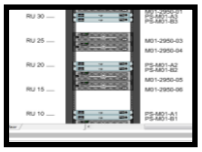


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Product Architecture

Design, Edit, Model, Execute
moves, adds, changes, deletions (MACD)

Editor-Users



RACKWISE SmartClient ™



Analyze, What-ifs, Optimize, Report
visualization, analytics, justification, reports

View-Only Users











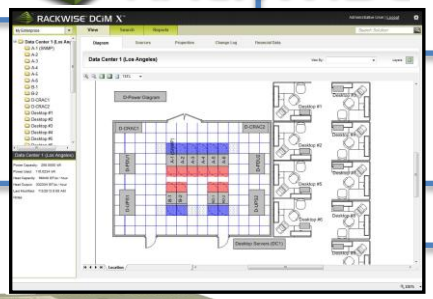








RACKWISE™







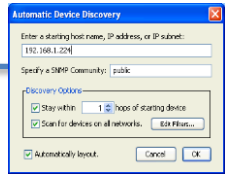
Microsoft
SQL Server and
Microsoft
Report Builder

Collecting Inventory









Integrations

RACKWISE Connectors

Web Services

API & SDK Interfaces







Real-Time Monitoring

IPMI, SNMP, SSH, WMI, Others

MODBUS Integration

API & SDK

Equipment

PDU

Power Strip

CRAC

Building Management Systems

RFID

RF Code

Architecture scales massively through flexible technology stack (from single servers through geographic clusters).

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Rackwise and Intel Innovation

RACKWISE incorporated the Intel DCM and Node Manager technologies into the core Rackwise DCiM X product.

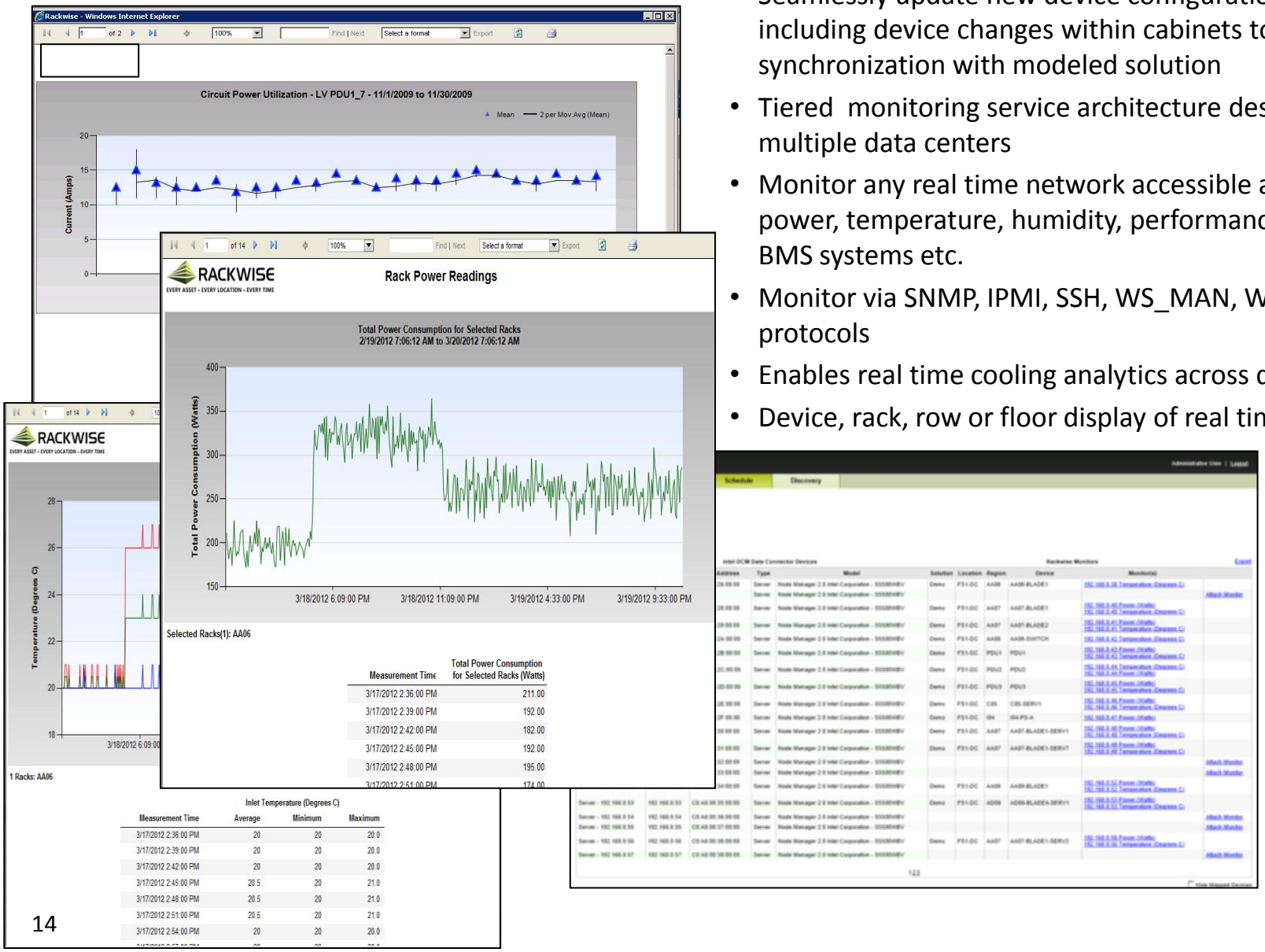
- ✓ Enhances Rackwise DCiM real-time monitoring framework
- ✓ Extends reporting for energy and thermal management
- ✓ Increases rack density through effective power capping
- ✓ Automates discovery of IT servers and power equipment
- ✓ Extends power chain visibility across broader range of assets
- ✓ Enhances accuracy for capacity planning and trend modeling
- ✓ Establishes policy-based power management



Intel is also a Rackwise DCiM X customer. Currently, the largest DCIM implementation in the industry.

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Auto Discovery and Real Time Device Monitoring



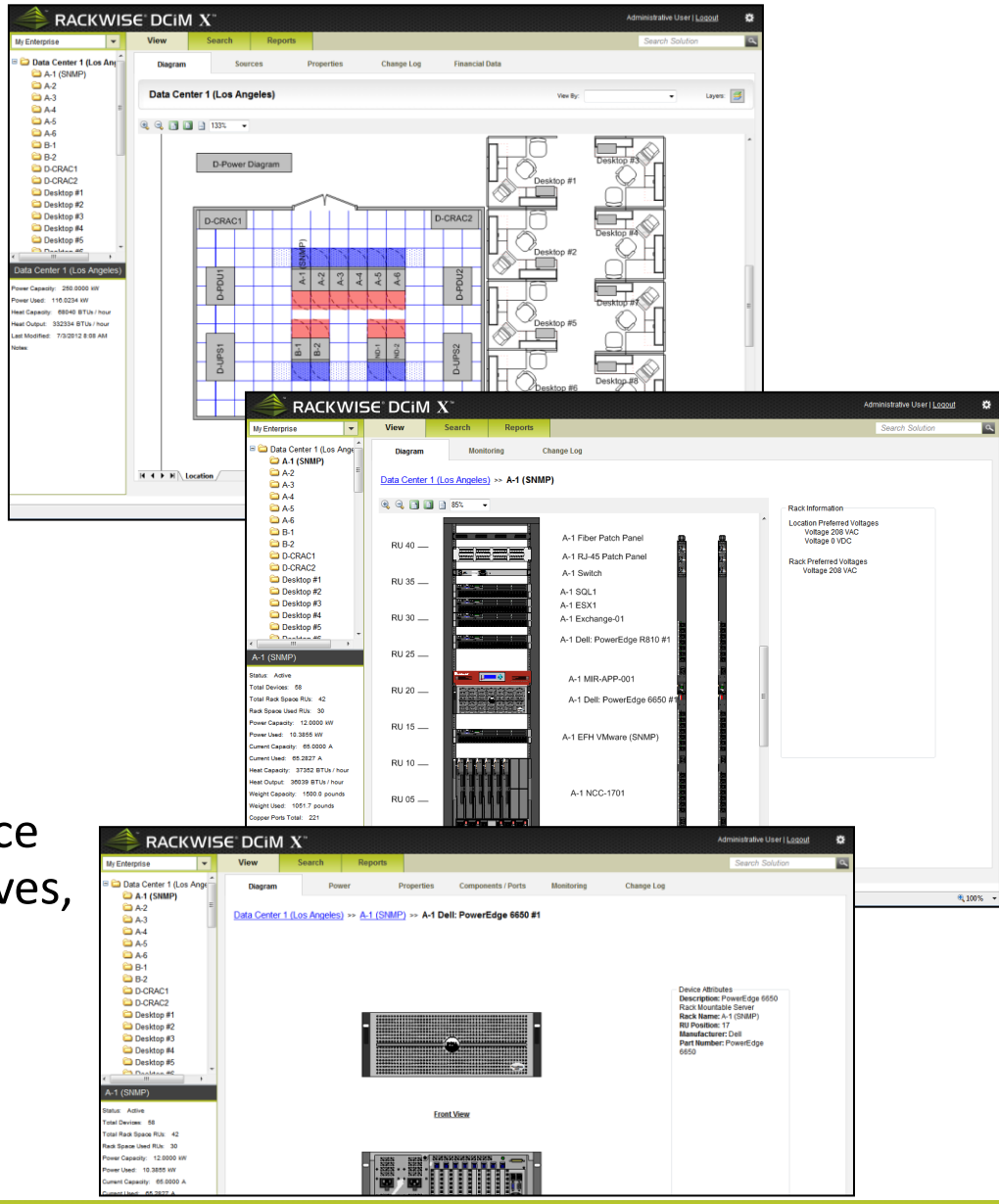
- Seamlessly update new device configuration information including device changes within cabinets to ensure on-going synchronization with modeled solution
- Tiered monitoring service architecture designed to support multiple data centers
- Monitor any real time network accessible attribute such as power, temperature, humidity, performance, disk utilization, BMS systems etc.
- Monitor via SNMP, IPMI, SSH, WS_MAN, WMI and other protocols
- Enables real time cooling analytics across data center floor
- Device, rack, row or floor display of real time data

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Data Center Visualization

DCM Portal

- Top Down Views of the Data Center
- Rollover Floor Equipment Mounted Status
- Customizable color coded floor plan dashboard for power, temperature, heat, amperage availability, port availability, etc.
- Drill through to rack visualizations
- Front Rear Rack Elevations
- Drill through to device elevations
- Front rear devices views
- Device representation matches device configuration for (NIC cards, disk drives, line cards, blades, etc.)

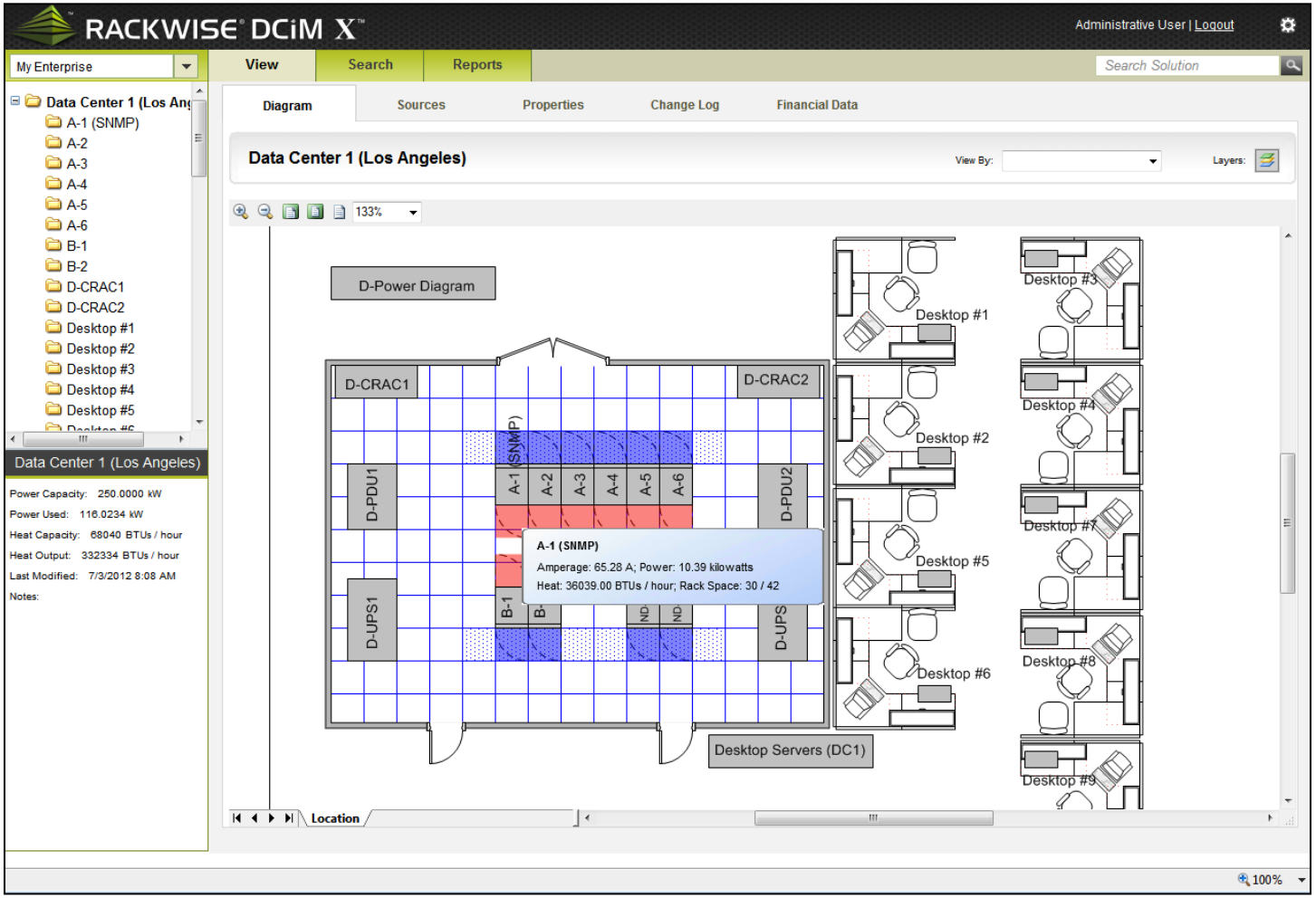


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Data Center Visualization

Intelligent Floor Plan Views

- Rack Locations
- Roll-over Display of Real-Time Measurements and Capacity
- Structured Cabling
- Multiple Layers

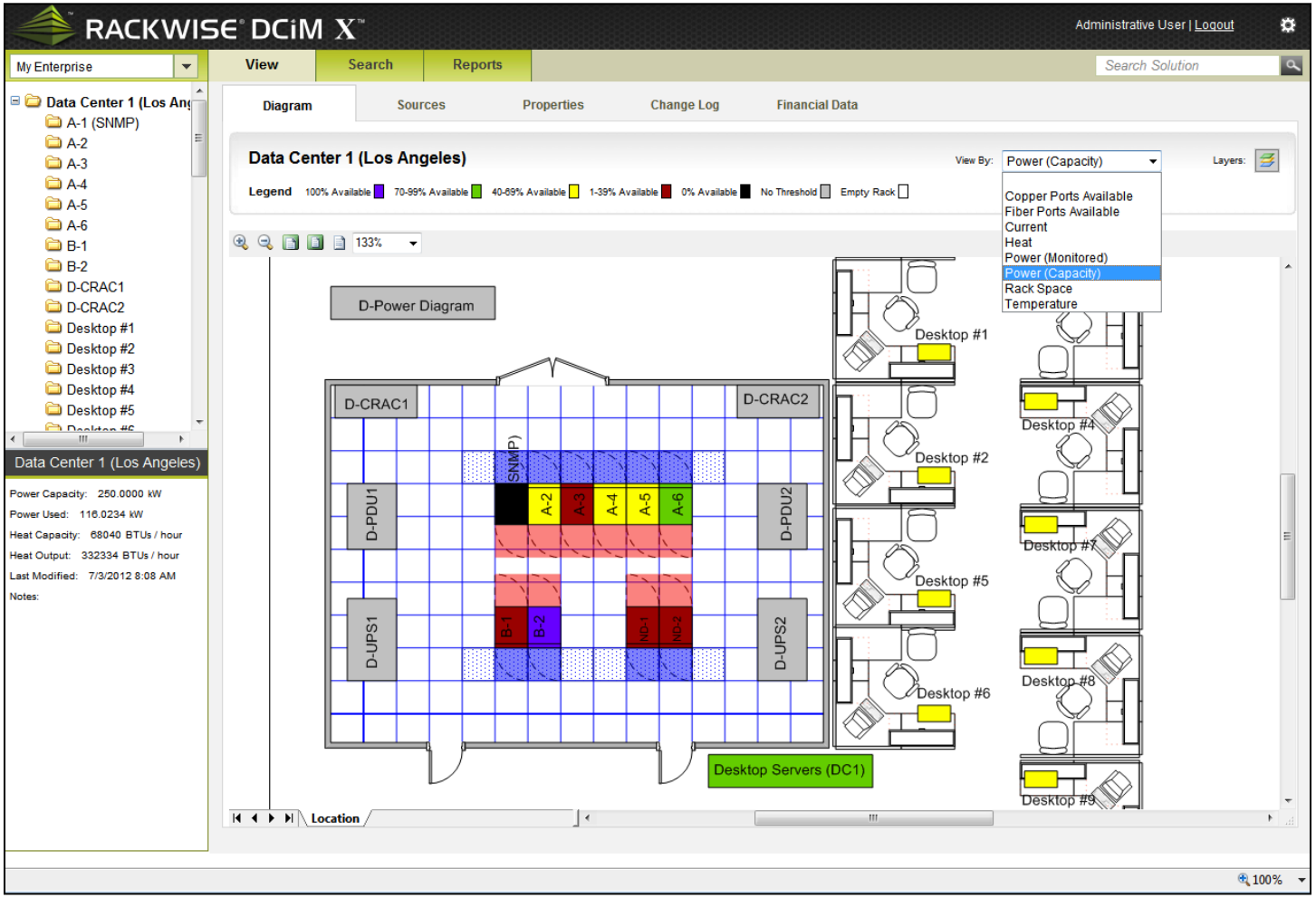


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Data Center Visualization

Intelligent Floor Plan Views (usage/capacity):

- Ports
- Current
- Heat
- Power
- Space

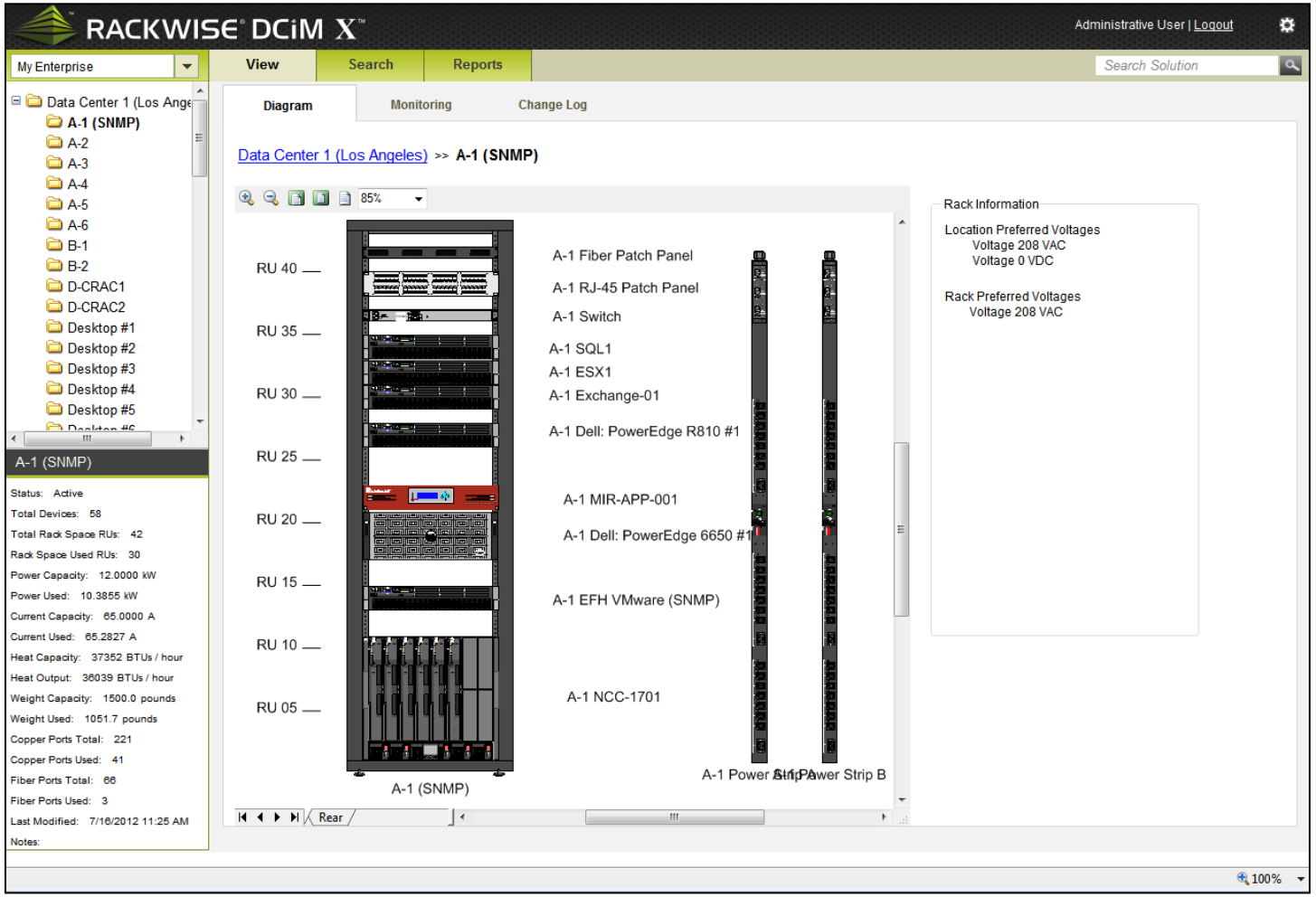


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Visualization - Rack And Device View

Rack Based Properties

- Power
- Current
- Space
- Heat
- Ports - power and network
- Weight
- Real Time Measurements

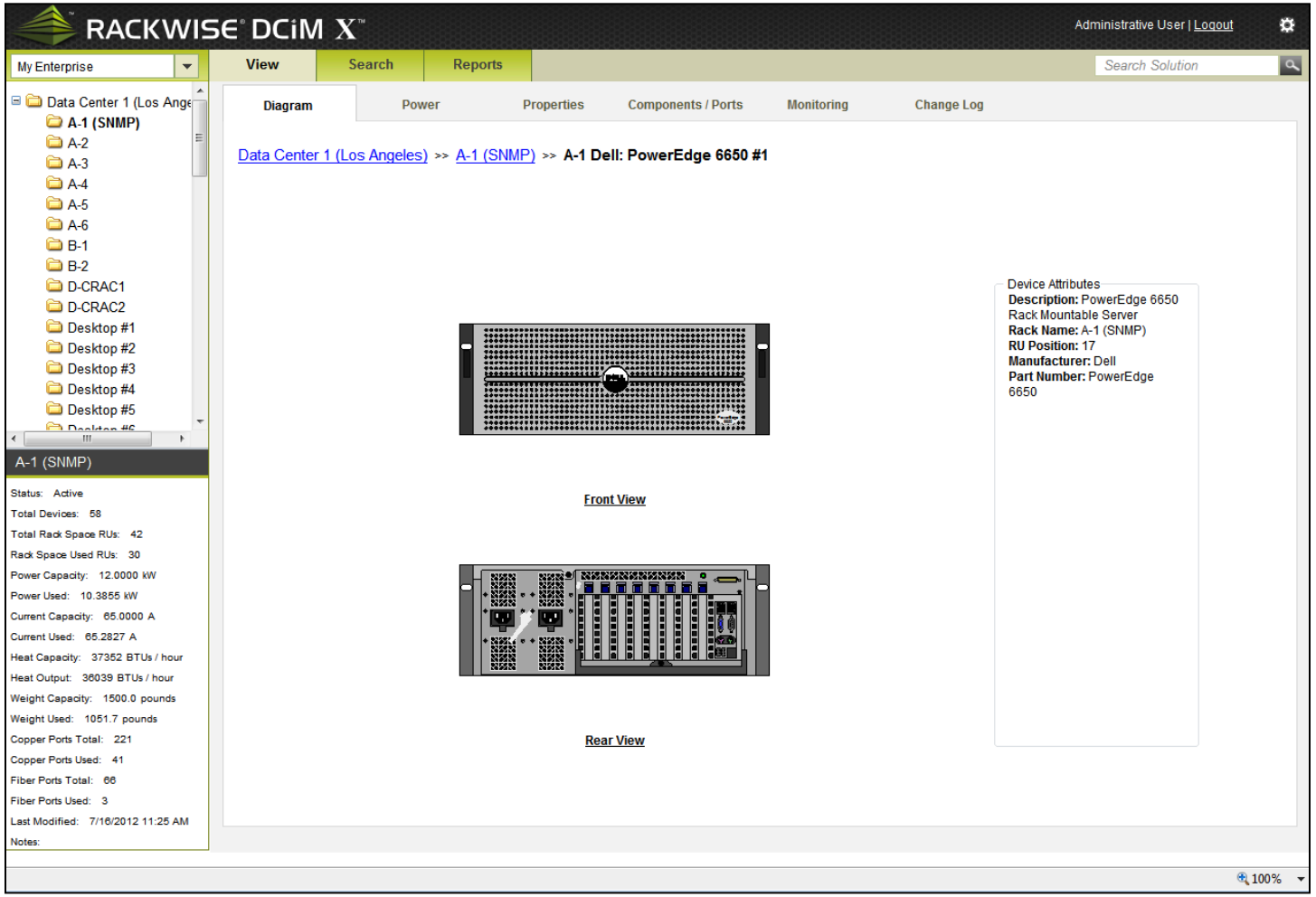


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Visualization – Device View

Asset Management

- Physical Assets
- Warranty / Lease Info
- Power and Network Cabling
- IP Addressing and VLANs
- Virtual Machines
- Software
- Business Services
- Department and Contact Info
- Customers



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Extreme Close up



All modules, power supplies, fans, and other equipment are accounted for





Each module part is inserted via SmartClient (or bulk-loaded via spreadsheet import to its precise slot location

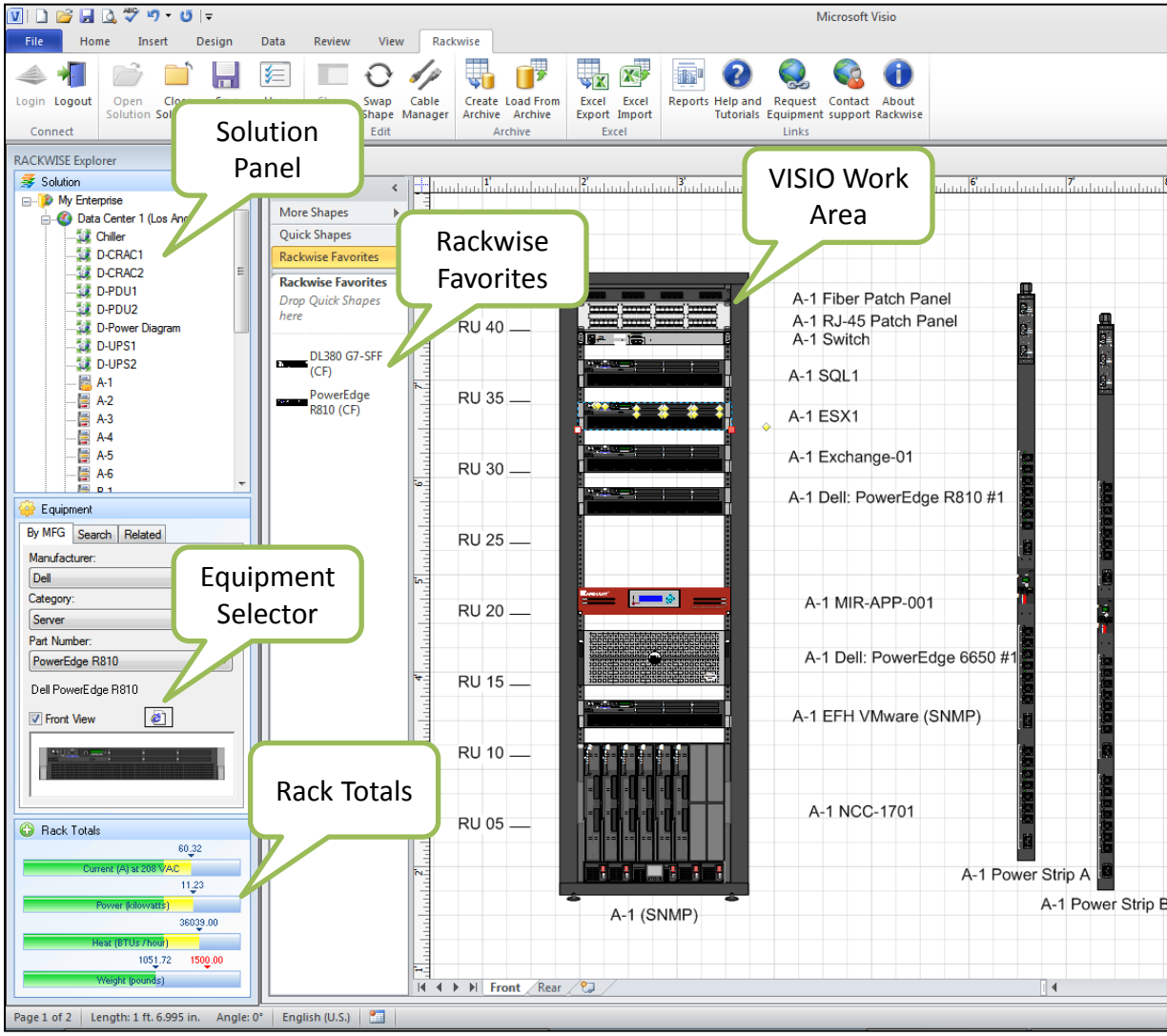
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Drag-n-Drop Data Center Modeling

DCiM SmartClient (VISIO)

- Drag and drop devices into designs from a library of over 32,000+ shapes from over 500 manufactures.
- Top down data center design
- Front/rear rack design
- Interactive visual resource consumption versus design limits displayed while editing

Leverages Microsoft Visio and Excel, the most commonly used tools in the data center.

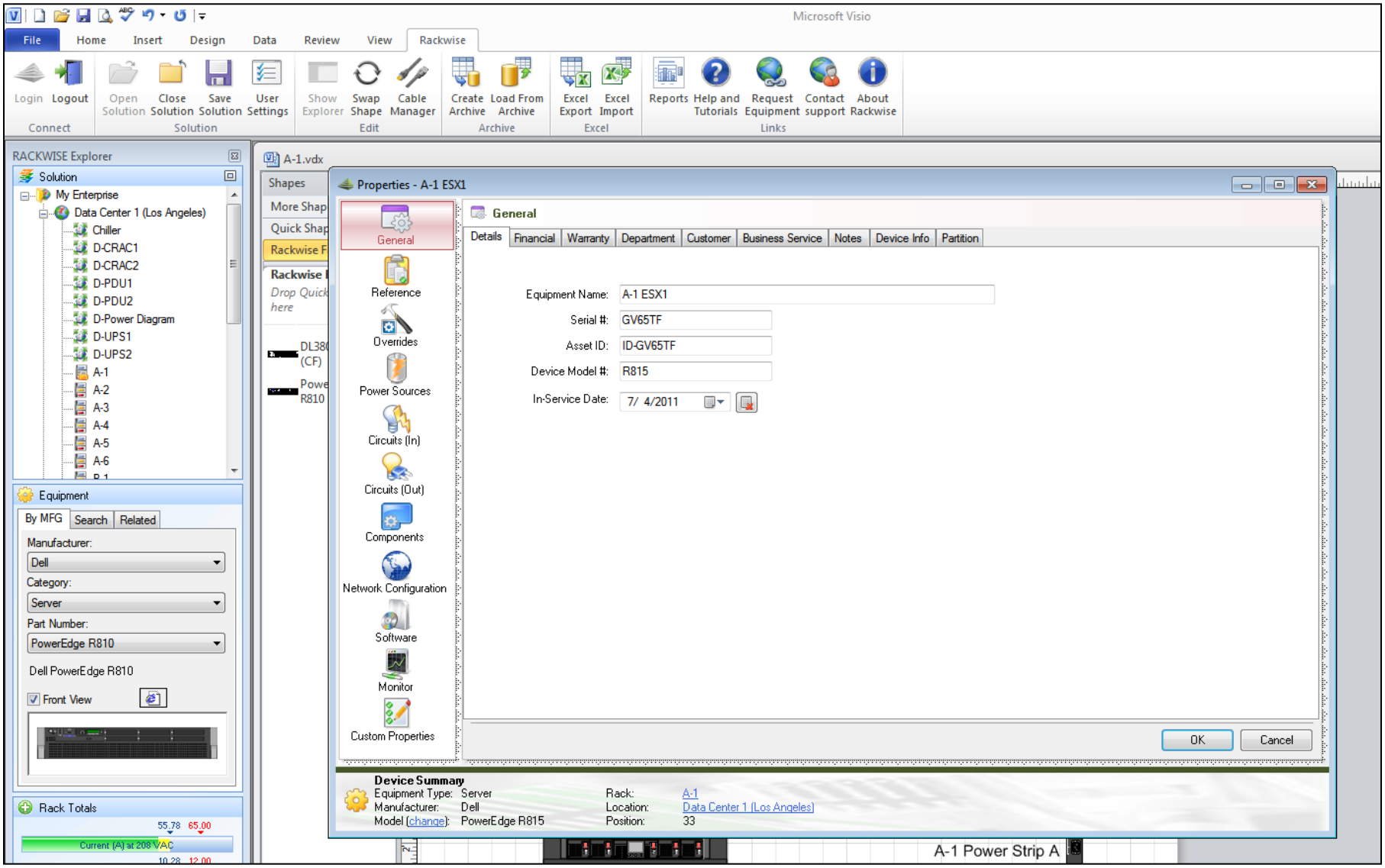






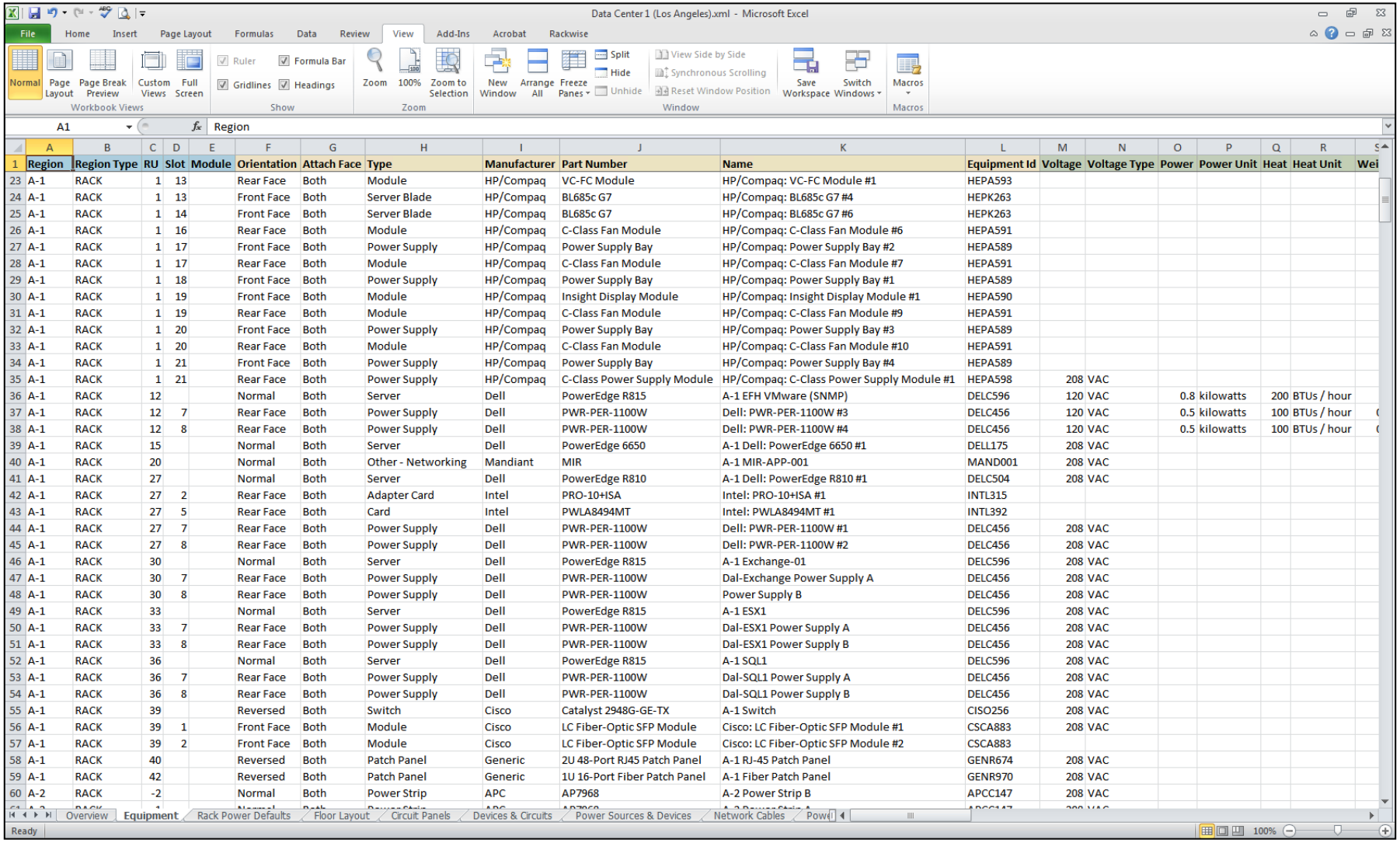
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Asset Properties



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Excel Based Bulk Data Transfer (including Verification Tools)

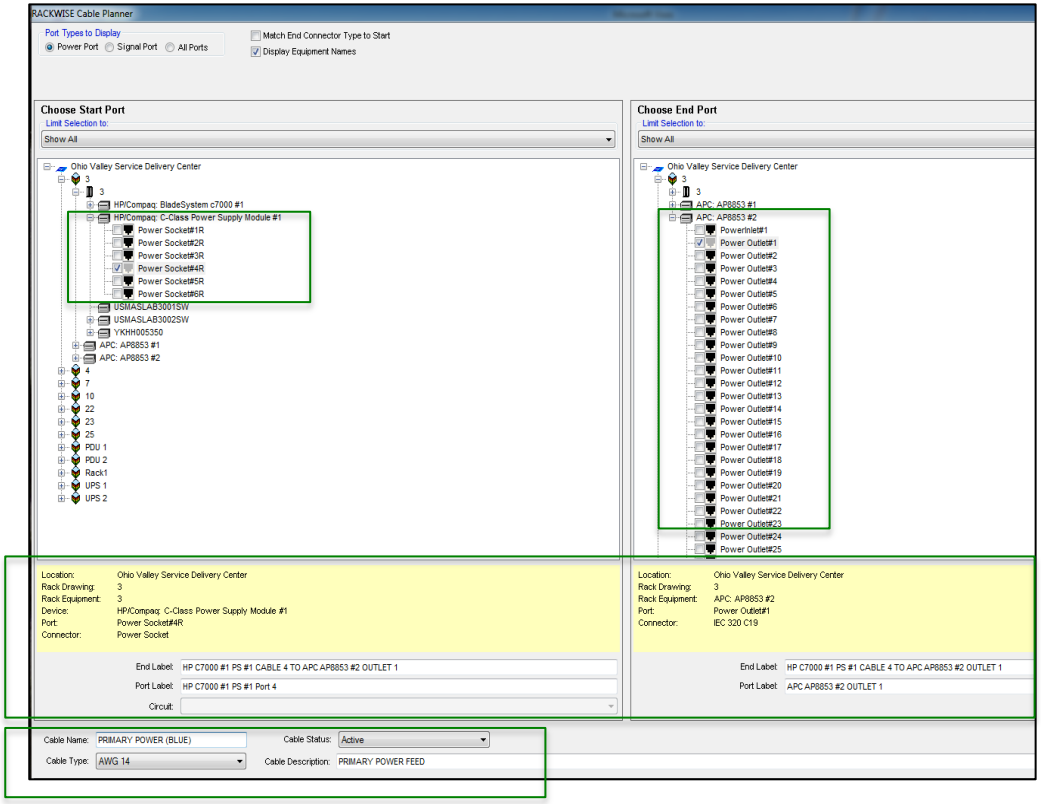


Region	Region Type	RU	Slot	Module	Orientation	Attach Face	Type	Manufacturer	Part Number	Name	Equipment Id	Voltage	Voltage Type	Power	Power Unit	Heat	Heat Unit
A-1	RACK	1	13		Rear Face	Both	Module	HP/Compaq	VC-FC Module	HP/Compaq: VC-FC Module #1	HEPA593						
A-1	RACK	1	13		Front Face	Both	Server Blade	HP/Compaq	BL685c G7	HP/Compaq: BL685c G7 #4	HEPK263						
A-1	RACK	1	14		Front Face	Both	Server Blade	HP/Compaq	BL685c G7	HP/Compaq: BL685c G7 #6	HEPK263						
A-1	RACK	1	16		Rear Face	Both	Module	HP/Compaq	C-Class Fan Module	HP/Compaq: C-Class Fan Module #6	HEPA591						
A-1	RACK	1	17		Front Face	Both	Power Supply	HP/Compaq	Power Supply Bay	HP/Compaq: Power Supply Bay #2	HEPA589						
A-1	RACK	1	17		Rear Face	Both	Module	HP/Compaq	C-Class Fan Module	HP/Compaq: C-Class Fan Module #7	HEPA591						
A-1	RACK	1	18		Front Face	Both	Power Supply	HP/Compaq	Power Supply Bay	HP/Compaq: Power Supply Bay #1	HEPA589						
A-1	RACK	1	19		Front Face	Both	Module	HP/Compaq	Insight Display Module	HP/Compaq: Insight Display Module #1	HEPA590						
A-1	RACK	1	19		Rear Face	Both	Module	HP/Compaq	C-Class Fan Module	HP/Compaq: C-Class Fan Module #9	HEPA591						
A-1	RACK	1	20		Front Face	Both	Power Supply	HP/Compaq	Power Supply Bay	HP/Compaq: Power Supply Bay #3	HEPA589						
A-1	RACK	1	20		Rear Face	Both	Module	HP/Compaq	C-Class Fan Module	HP/Compaq: C-Class Fan Module #10	HEPA591						
A-1	RACK	1	21		Front Face	Both	Power Supply	HP/Compaq	Power Supply Bay	HP/Compaq: Power Supply Bay #4	HEPA589						
A-1	RACK	1	21		Rear Face	Both	Power Supply	HP/Compaq	C-Class Power Supply Module	HP/Compaq: C-Class Power Supply Module #1	HEPA598	208	VAC				
A-1	RACK	12			Normal	Both	Server	Dell	PowerEdge R815	A-1 EFH VMware (SNMP)	DELC596	120	VAC	0.8	kilowatts	200	BTUs / hour
A-1	RACK	12	7		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Dell: PWR-PER-1100W #3	DELC456	120	VAC	0.5	kilowatts	100	BTUs / hour
A-1	RACK	12	8		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Dell: PWR-PER-1100W #4	DELC456	120	VAC	0.5	kilowatts	100	BTUs / hour
A-1	RACK	15			Normal	Both	Server	Dell	PowerEdge 6650	A-1 Dell: PowerEdge 6650 #1	DELL175	208	VAC				
A-1	RACK	20			Normal	Both	Other - Networking	Mandiant	MIR	A-1 MIR-APP-001	MAND001	208	VAC				
A-1	RACK	27			Normal	Both	Server	Dell	PowerEdge R810	A-1 Dell: PowerEdge R810 #1	DELC504	208	VAC				
A-1	RACK	27	2		Rear Face	Both	Adapter Card	Intel	PRO-10+ISA	Intel: PRO-10+ISA #1	INTL315						
A-1	RACK	27	5		Rear Face	Both	Card	Intel	PWLA8494MT	Intel: PWLA8494MT #1	INTL392						
A-1	RACK	27	7		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Dell: PWR-PER-1100W #1	DELC456	208	VAC				
A-1	RACK	27	8		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Dell: PWR-PER-1100W #2	DELC456	208	VAC				
A-1	RACK	30			Normal	Both	Server	Dell	PowerEdge R815	A-1 Exchange-01	DELC596	208	VAC				
A-1	RACK	30	7		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Dal-Exchange Power Supply A	DELC456	208	VAC				
A-1	RACK	30	8		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Power Supply B	DELC456	208	VAC				
A-1	RACK	33			Normal	Both	Server	Dell	PowerEdge R815	A-1 ESX1	DELC596	208	VAC				
A-1	RACK	33	7		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Dal-ESX1 Power Supply A	DELC456	208	VAC				
A-1	RACK	33	8		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Dal-ESX1 Power Supply B	DELC456	208	VAC				
A-1	RACK	36			Normal	Both	Server	Dell	PowerEdge R815	A-1 SQL1	DELC596	208	VAC				
A-1	RACK	36	7		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Dal-SQL1 Power Supply A	DELC456	208	VAC				
A-1	RACK	36	8		Rear Face	Both	Power Supply	Dell	PWR-PER-1100W	Dal-SQL1 Power Supply B	DELC456	208	VAC				
A-1	RACK	39			Reversed	Both	Switch	Cisco	Catalyst 2948G-GE-TX	A-1 Switch	CISO256	208	VAC				
A-1	RACK	39	1		Front Face	Both	Module	Cisco	LC Fiber-Optic SFP Module	Cisco: LC Fiber-Optic SFP Module #1	CSCA883	208	VAC				
A-1	RACK	39	2		Front Face	Both	Module	Cisco	LC Fiber-Optic SFP Module	Cisco: LC Fiber-Optic SFP Module #2	CSCA883						
A-1	RACK	40			Reversed	Both	Patch Panel	Generic	2U 48-Port RJ45 Patch Panel	A-1 RJ-45 Patch Panel	GENR674	208	VAC				
A-1	RACK	42			Reversed	Both	Patch Panel	Generic	1U 16-Port Fiber Patch Panel	A-1 Fiber Patch Panel	GENR970	208	VAC				
A-2	RACK	-2			Normal	Both	Power Strip	APC	AP7968	A-2 Power Strip B	APCC147	208	VAC				

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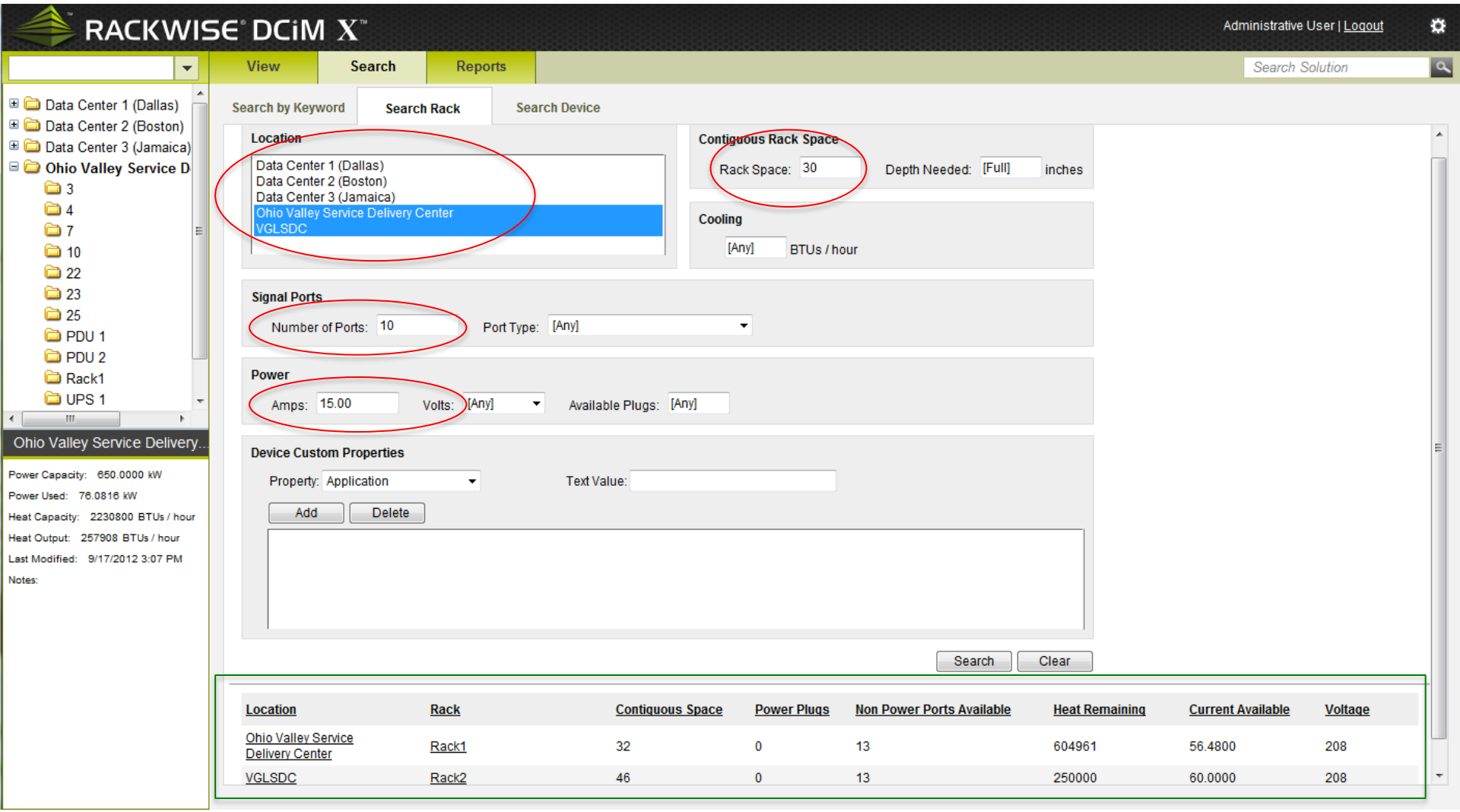
Cable Management

- Network Cabling
  - Document network cabling from port to patch panel, from patch panel to device, etc.
  - Match cable type and network connector when configuring connections
  - Track cable pathways through multiple hops
  - Produce cable pathway reports
  - Patch schedules
  - Device Connectivity reports
  - Labeling for local and report cable ends, and port markers
- Power Cabling
  - Track power connectivity from source, public utility or generator, to/from ATS, UPS, PDU, RPP, breaker, and power strip



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Intelligent Search, Optimal Placement



Intelligent Search for available locations by Space, Power and other criteria

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Rackwise® DCM Reports

Over 100+ killer reports out of the box

Standard

- Assets
  - Application, Customer, Asset ID, Device Type, IP Address, Manufacturer
- Business
  - Lease Expiration, Lease Report, Maintenance Expiration, Maintenance Report, Warranty Report
- Cabling
  - Cable Pathway, Connectivity, Device Interface, Patch Panel Schedule, Rack Patch Panel Infrastructure
- Equipment
  - Assembly Report, Device Report, Dimensions, Incremental Assembly, Solution Properties, Virtual Machine
- Power
  - Capacity, Power by Equipment Detail, Power by Rack Detail, Power by Rack Summary, Power Usage by Top Ten Named Racks

Power Management

- Circuits
  - Cascading Circuit Failure, Cascading Device Failure, Cascading PDU Failure, Cascading Source Failure, Circuit Detail, Circuit Summary
- Equipment
  - Equipment Redundancy, Power by Rack Detail, Top Power Consumers, Unpowered Equipment
- Power Equipment
  - Power Device Balance Graph, Power Device Summary, Source Detail, Source Shutdown Impact Report, Source Summary Graph, Source Summary
- Power Sources
  - Source Detail, Source Shutdown Impact, Source Summary, Source Summary Graph
- Real-Time Monitoring
  - Circuit Power Utilization, Real-Time Power by Circuit, SNMP OID Monitor, VM CPU Utilization

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Rackwise® DCM Reports

Report authoring uses Microsoft Report Builder

Historical & Trend

- Forecast
  - Location Heat Trend, Location Power Trend, Location Rack Trend, Location Weight Trend, Power Dashboard
- Historical
  - Location Current Trend, Location Dashboard, Location Power Utilization Trend, Location Rack History Trend, Location Signal Port Availability Trend, PDU History Trend, Rack History Trend

Green Data Center

- Green Report
  - Power Usage Effectiveness (PUE), Data Center Efficiency (DCiE)
- Green Data Center Trend

Financial Analysis

- Business Service
  - Business Service, Business Service by Device, Business Service by Location, Business Service by Service Name, Business Service by VM
- Charge Back
  - Charge Back
- Financial
  - Capital Expenses, Energy Cost, Financial Summary, Operational Expenses
- Optimization
  - Cost/Savings Analysis, Mass Replacement Cost/Savings, Top Resource Consumers

Custom Reports

- Created by user

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Rackwise DCiM Demonstration



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Rackwise® DCiM Reports

- Rackwise provides over 100+ Reports out of the box.
- All reports may be easily customized to meet any need.

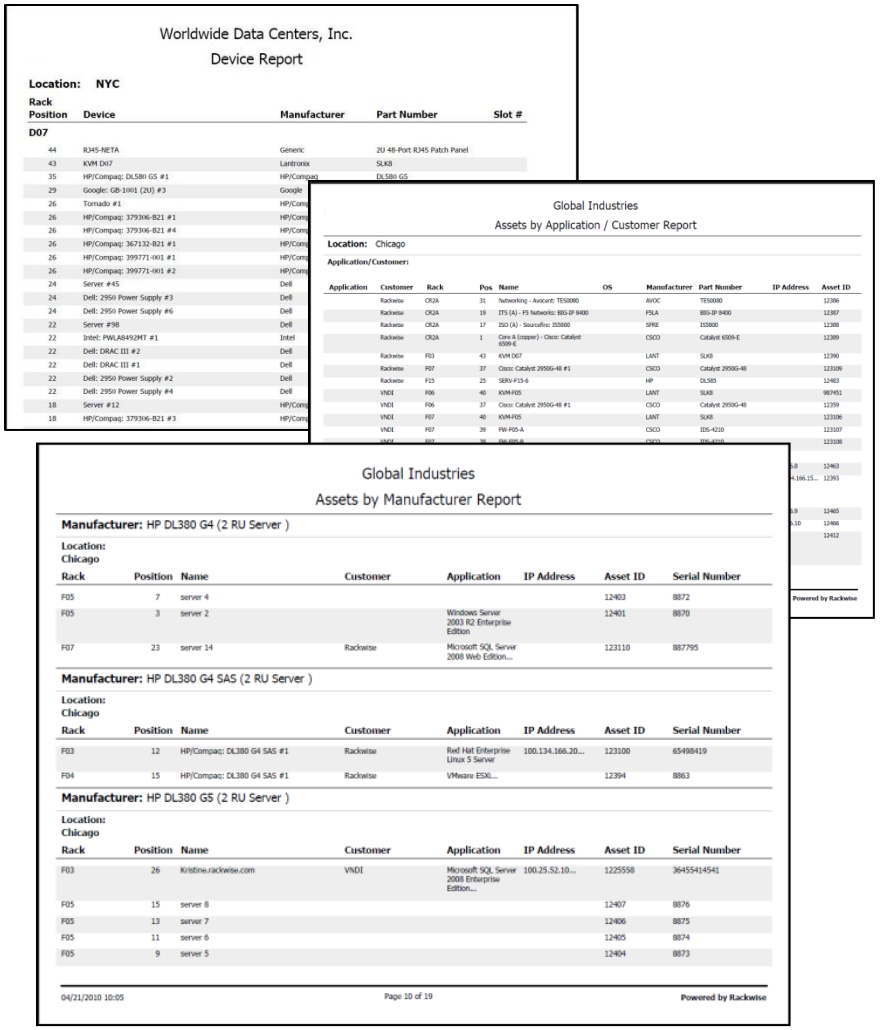


Reports from Rackwise aggregate data from many sources and gives customers the business intelligence and predictive "what-if" analysis to make educated decisions on how and where to lower their costs and optimize their enterprise.

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Asset Management

- All physical inventory (racks, devices, device modules and blades, floor mounted equipment)
- All software assets. (operating systems, VM software, utilities, applications)
- Association of warranty, service contracts, service cycle and lifetimes to hardware and software assets.
- Association of business service, application, business unit or department, contact information
- Tracked information is fully end user customizable. Users may add “custom properties”, any information and value to be tracked.



Worldwide Data Centers, Inc.

Device Report

Location: NYC

Rack Position	Device	Manufacturer	Part Number	Slot #
D07				
44	RJ45-NETA	Generic	2U 48-Port RJ45 Patch Panel	
43	KVM D07	Lantronix	SLK8	
35	HP/Compaq: DL580 G5 #1	HP/Compaq	DL580 G5	
29	Google: GB-1001 (2U) #3	Google		
26	Tornado #1	HP/Comp		
26	HP/Compaq: 379306-B21 #1	HP/Comp		
26	HP/Compaq: 379306-B21 #4	HP/Comp		
26	HP/Compaq: 367132-B21 #1	HP/Comp		
26	HP/Compaq: 399771-001 #1	HP/Comp		
26	HP/Compaq: 399771-001 #2	HP/Comp		
24	Server #45	Dell		
24	Dell: 2950 Power Supply #3	Dell		
24	Dell: 2950 Power Supply #6	Dell		
22	Server #98	Dell		
22	Intel: PWLA8492MT #1	Intel		
22	Dell: DRAC III #2	Dell		
22	Dell: DRAC III #1	Dell		
22	Dell: 2950 Power Supply #2	Dell		
22	Dell: 2950 Power Supply #4	Dell		
18	Server #12	HP/Comp		
18	HP/Compaq: 379306-B21 #3	HP/Comp		

Global Industries

Assets by Application / Customer Report

Location: Chicago

Application/Customer:

Application	Customer	Rack	Pos	Name	OS	Manufacturer	Part Number	IP Address	Asset ID
	Rackwise	CR2A	31	Networking - Avocent: TES0080		AVOC	TES0080		12386
	Rackwise	CR2A	19	ITS (A) - F5 Networks: BIG-IP 8400		F5LA	BIG-IP 8400		12387
	Rackwise	CR2A	17	ISO (A) - Sourcefire: IS5800		SFRE	IS5800		12388
	Rackwise	CR2A	1	Core A (copper) - Cisco: Catalyst 6509-E		CISCO	Catalyst 6509-E		12389
	Rackwise	F03	43	KVM D07		LANT	SLK8		12390
	Rackwise	F07	37	Cisco: Catalyst 2950G-48 #1		CISCO	Catalyst 2950G-48		123109
	Rackwise	F15	25	SERV-F15-6		HP	DL585		12483
	VNDI	F06	40	KVM-F05		LANT	SLK8		987451
	VNDI	F06	37	Cisco: Catalyst 2950G-48 #1		CISCO	Catalyst 2950G-48		12359
	VNDI	F07	40	KVM-F05		LANT	SLK8		123106
	VNDI	F07	39	PW-F05-A		CISCO	IDS-4210		123107
	VNDI	F07	38	PW-F05-B		CISCO	IDS-4210		123108

Global Industries

Assets by Manufacturer Report

Manufacturer: HP DL380 G4 (2 RU Server)

Location: Chicago

Rack	Position	Name	Customer	Application	IP Address	Asset ID	Serial Number
F05	7	server 4				12403	8872
F05	3	server 2		Windows Server 2003 R2 Enterprise Edition		12401	8870
F07	23	server 14	Rackwise	Microsoft SQL Server 2008 Web Edition...		123110	887795

Manufacturer: HP DL380 G4 SAS (2 RU Server)

Location: Chicago

Rack	Position	Name	Customer	Application	IP Address	Asset ID	Serial Number
F03	12	HP/Compaq: DL380 G4 SAS #1	Rackwise	Red Hat Enterprise Linux 5 Server	100.134.166.20...	123100	65498419
F04	15	HP/Compaq: DL380 G4 SAS #1	Rackwise	VMware ESXi...		12394	8863

Manufacturer: HP DL380 G5 (2 RU Server)

Location: Chicago

Rack	Position	Name	Customer	Application	IP Address	Asset ID	Serial Number
F03	26	Kristine.rackwise.com	VNDI	Microsoft SQL Server 2008 Enterprise Edition...	100.25.52.10...	1225558	36455414541
F05	15	server 8				12407	8876
F05	13	server 7				12406	8875
F05	11	server 6				12405	8874
F05	9	server 5				12404	8873

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Power Management

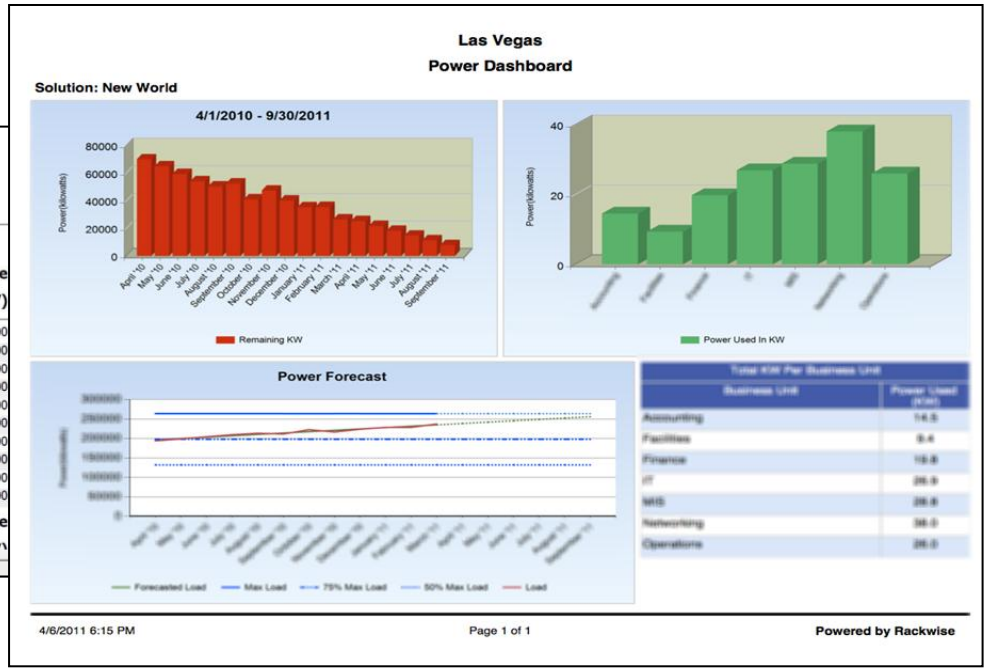
- Documentation of the data center power network
- Full 3 Phase power support
- Full power infrastructure capacity reporting including real time device measurement via Intel DCM
- Power consumption can either be drawn from the real world environment or de-rated from a data base of over 32,000 shapes with manufactures name plate data.
- Identification of top power consuming racks

Demo 1

Power by Rack Detail Report

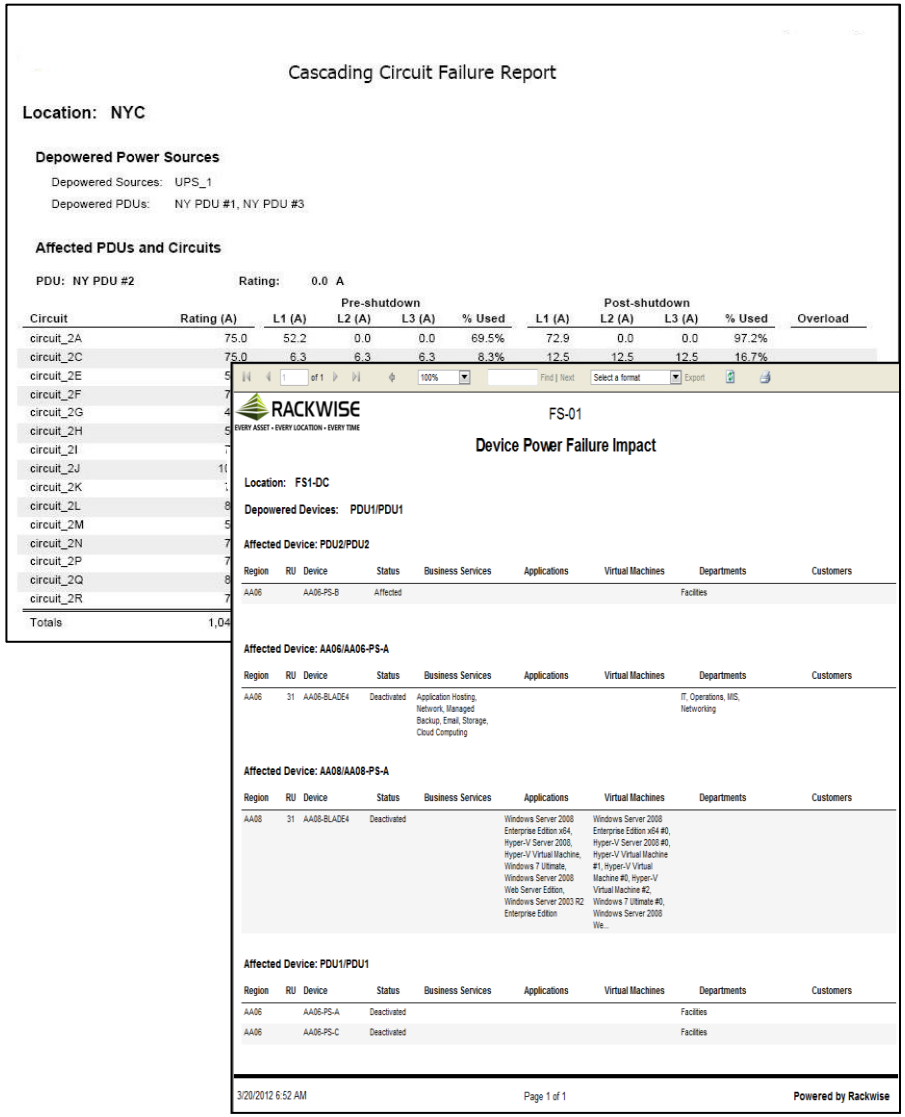
Location: NYC

Rack	Position	Equipment	Customer	Power (kilowatts)	Current (Amps)	Voltage (V)
D07	43	LANT SLK8		0.11	0.93	120.00
D07	26	HP DL380 G5		0.44	3.63	120.00
D07	24	DELL PowerEdge 2950	IT	0.41	3.38	120.00
D07	22	DELL PowerEdge 2950	HR	0.45	3.75	120.00
D07	18	HP DL585 G2	QA	0.88	7.34	120.00
D07	16	IBM xSeries 346	Sales	0.75	6.25	120.00
D07	14	DELL PowerEdge 2950	Accounting	0.45	3.75	120.00
D07	12	HP DL380 G4 SAS	Accounting	0.48	3.96	120.00
D07	5	DELL PowerEdge 6400 - Rackmount	Accounting	0.39	3.25	120.00
D07	1	IBM p5-570	R&D	0.85	7.04	120.00



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Fault Impact Analysis



Cascading Circuit Failure Report

Location: NYC

Depowered Power Sources

Depowered Sources: UPS_1

Depowered PDUs: NY PDU #1, NY PDU #3

Affected PDUs and Circuits

PDU: NY PDU #2 Rating: 0.0 A

Circuit	Rating (A)	Pre-shutdown L1 (A)	Pre-shutdown L2 (A)	Pre-shutdown L3 (A)	Pre-shutdown % Used	Post-shutdown L1 (A)	Post-shutdown L2 (A)	Post-shutdown L3 (A)	Post-shutdown % Used	Overload
circuit_2A	75.0	52.2	0.0	0.0	69.5%	72.9	0.0	0.0	97.2%	
circuit_2C	75.0	6.3	6.3	6.3	8.3%	12.5	12.5	12.5	16.7%	
circuit_2E	5									
circuit_2F	7									
circuit_2G	4									
circuit_2H	5									
circuit_2I	7									
circuit_2J	1(									
circuit_2K	1									
circuit_2L	8									
circuit_2M	5									
circuit_2N	7									
circuit_2P	7									
circuit_2Q	8									
circuit_2R	7									
Totals	1,04									

RACKWISE
EVERY ASSET - EVERY LOCATION - EVERY TIME

FS-01

Device Power Failure Impact

Location: FS1-DC

Depowered Devices: PDU1/PDU1

Affected Device: PDU2/PDU2

Region	RU	Device	Status	Business Services	Applications	Virtual Machines	Departments	Customers
AA06		AA06-PS-B	Affected				Facilities	

Affected Device: AA06/AA06-PS-A

Region	RU	Device	Status	Business Services	Applications	Virtual Machines	Departments	Customers
AA06	31	AA06-BLADE4	Deactivated	Application Hosting, Network, Managed Backup, Email, Storage, Cloud Computing			IT, Operations, MIS, Networking	

Affected Device: AA08/AA08-PS-A

Region	RU	Device	Status	Business Services	Applications	Virtual Machines	Departments	Customers
AA08	31	AA08-BLADE4	Deactivated		Windows Server 2008 Enterprise Edition x64, Hyper-V Server 2008, Hyper-V Virtual Machine, Windows 7 Ultimate, Windows Server 2008 Web Server Edition, Windows Server 2003 R2 Enterprise Edition	Windows Server 2008 Enterprise Edition x64 #0, Hyper-V Server 2008 #0, Hyper-V Virtual Machine #1, Hyper-V Virtual Machine #0, Hyper-V Virtual Machine #2, Windows 7 Ultimate #0, Windows Server 2008 We...		

Affected Device: PDU1/PDU1

Region	RU	Device	Status	Business Services	Applications	Virtual Machines	Departments	Customers
AA06		AA06-PS-A	Deactivated				Facilities	
AA06		AA06-PS-C	Deactivated				Facilities	

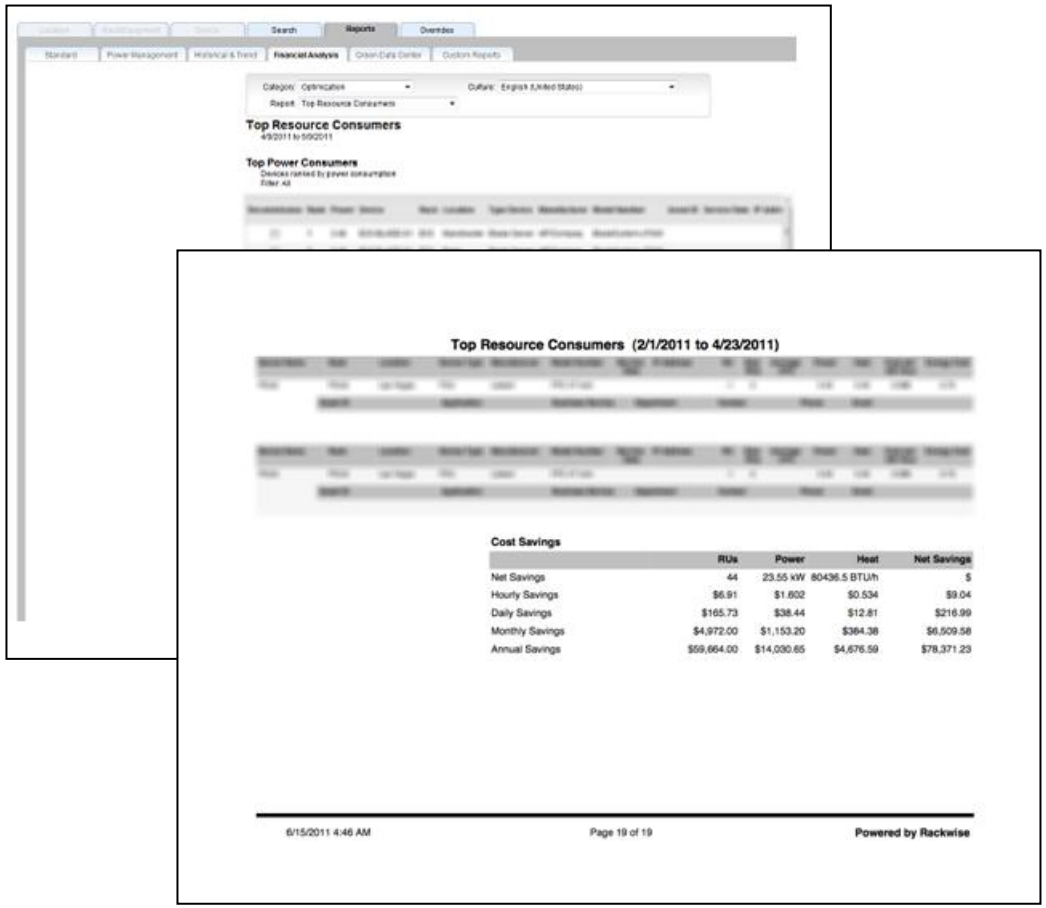
3/20/2012 6:52 AM Page 1 of 1 Powered by Rackwise

- Calculate:
  - Server and device redundancy to power
- Simulate:
  - Impact of failures of components of the power and network infrastructure
- Determine:
  - Which servers or devices will be affected by a failure in the power or network system
  - Analyze Impacted devices back to affected applications, customers and business services.
  - If a power system component failure will cause a cascading failure in the power system
  - Which individual circuits will be affected and the amount of overdraw that will occur

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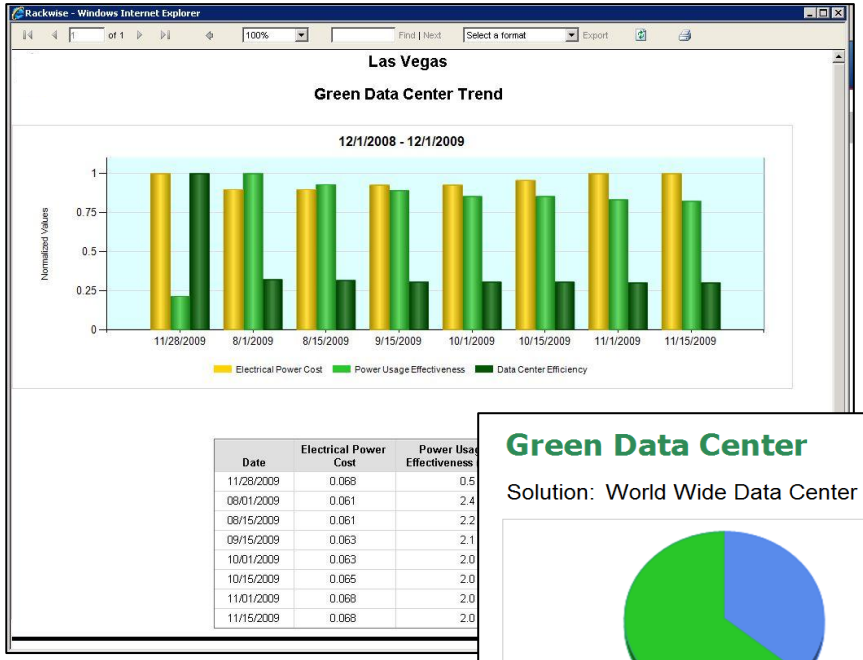
Top Resource Consumers (What-if?)

- Determine the top power consuming devices
- Determine server consolidation, decommissioning or virtualization candidates by:
  - Low CPU utilization
  - High power consumption
  - High heat generation
  - Business Service
  - Space
- Instantly calculate savings of decommission selected devices

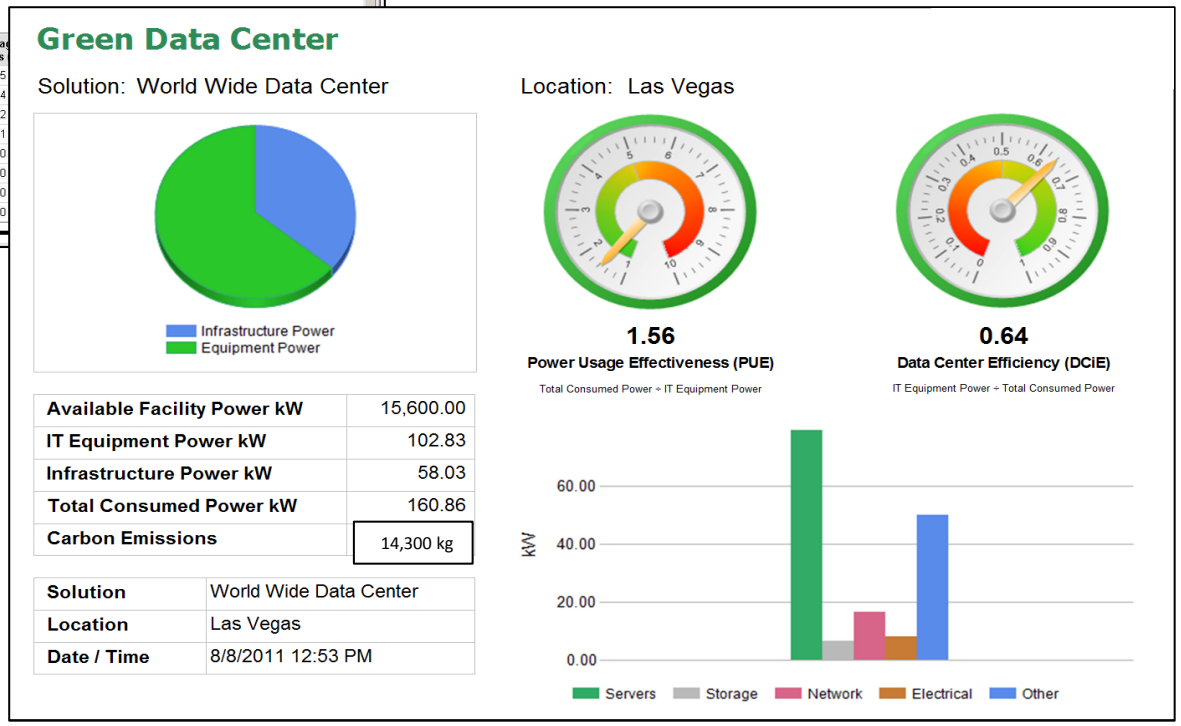


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Green Data Center



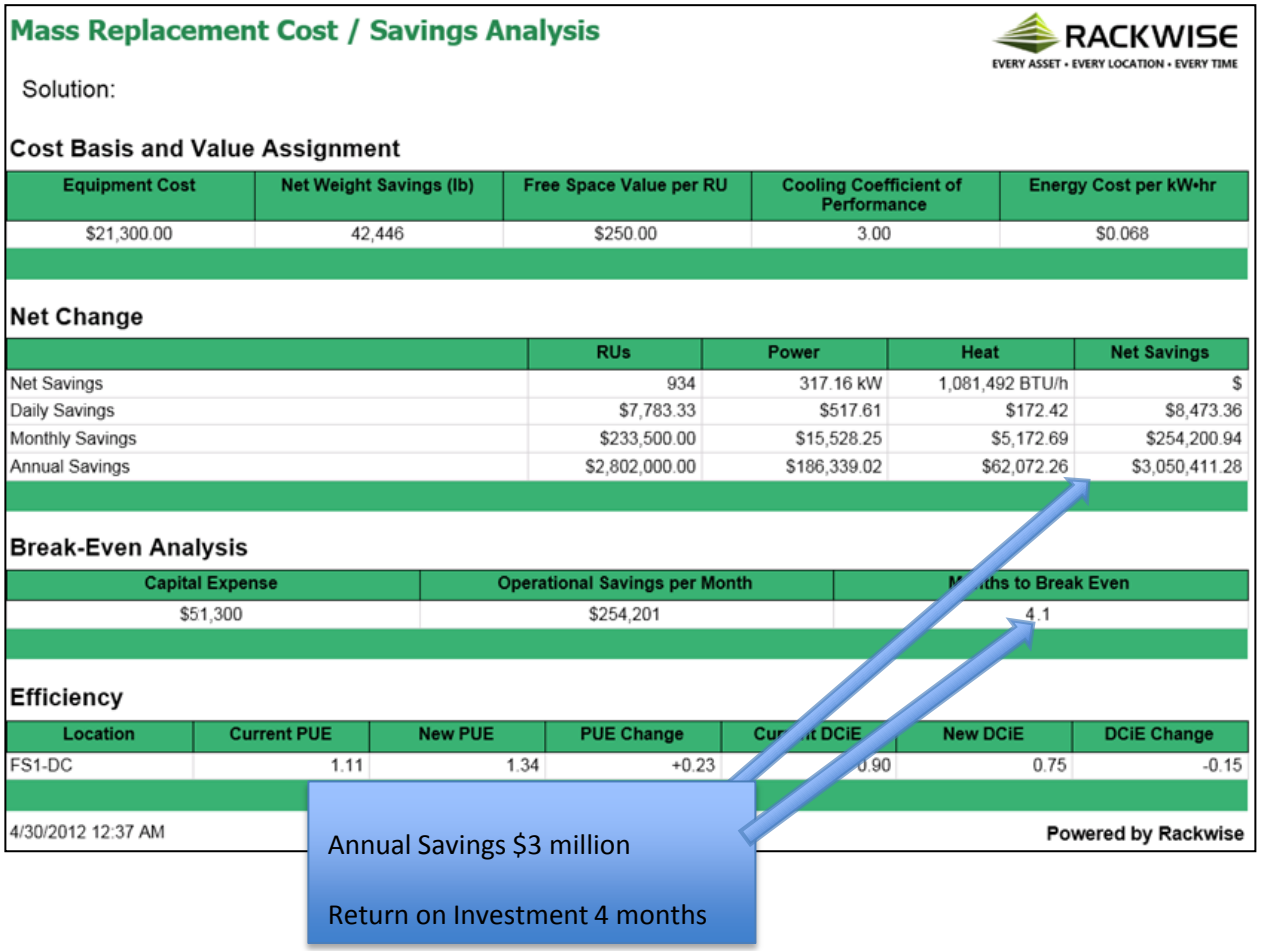
- Calculate and display PUE and DCiE on a presentation quality dashboard
- Calculate and display data center carbon footprint
- Continually calculate PUE and DCiE and report over time



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Cost/Savings Analysis (What-if?)

- Determine the financial impact of proposed data center changes
- Replace resource intensive and inefficient equipment
- Estimate data center PUE impact
- Drive ongoing cost savings
- Data center consolidation planning



Mass Replacement Cost / Savings Analysis

RACKWISE
EVERY ASSET • EVERY LOCATION • EVERY TIME

Solution:

Cost Basis and Value Assignment

Equipment Cost	Net Weight Savings (lb)	Free Space Value per RU	Cooling Coefficient of Performance	Energy Cost per kW•hr
$21,300.00	42,446	$250.00	3.00	$0.068

Net Change

	RUs	Power	Heat	Net Savings
Net Savings	934	317.16 kW	1,081,492 BTU/h	$
Daily Savings	$7,783.33	$517.61	$172.42	$8,473.36
Monthly Savings	$233,500.00	$15,528.25	$5,172.69	$254,200.94
Annual Savings	$2,802,000.00	$186,339.02	$62,072.26	$3,050,411.28

Break-Even Analysis

Capital Expense	Operational Savings per Month	Months to Break Even
$51,300	$254,201	4.1

Efficiency

Location	Current PUE	New PUE	PUE Change	Current DCiE	New DCiE	DCiE Change
FS1-DC	1.11	1.34	+0.23	0.90	0.75	-0.15

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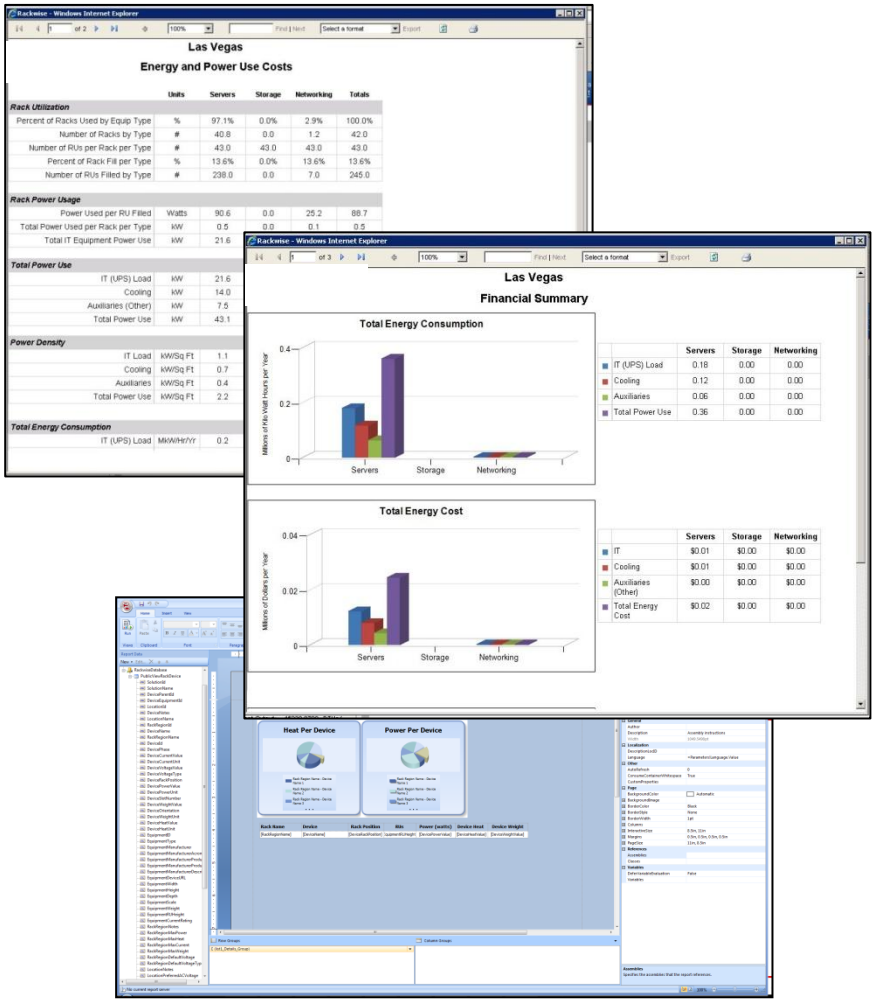
Annual Savings $3 million

Return on Investment 4 months

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Executive Reporting

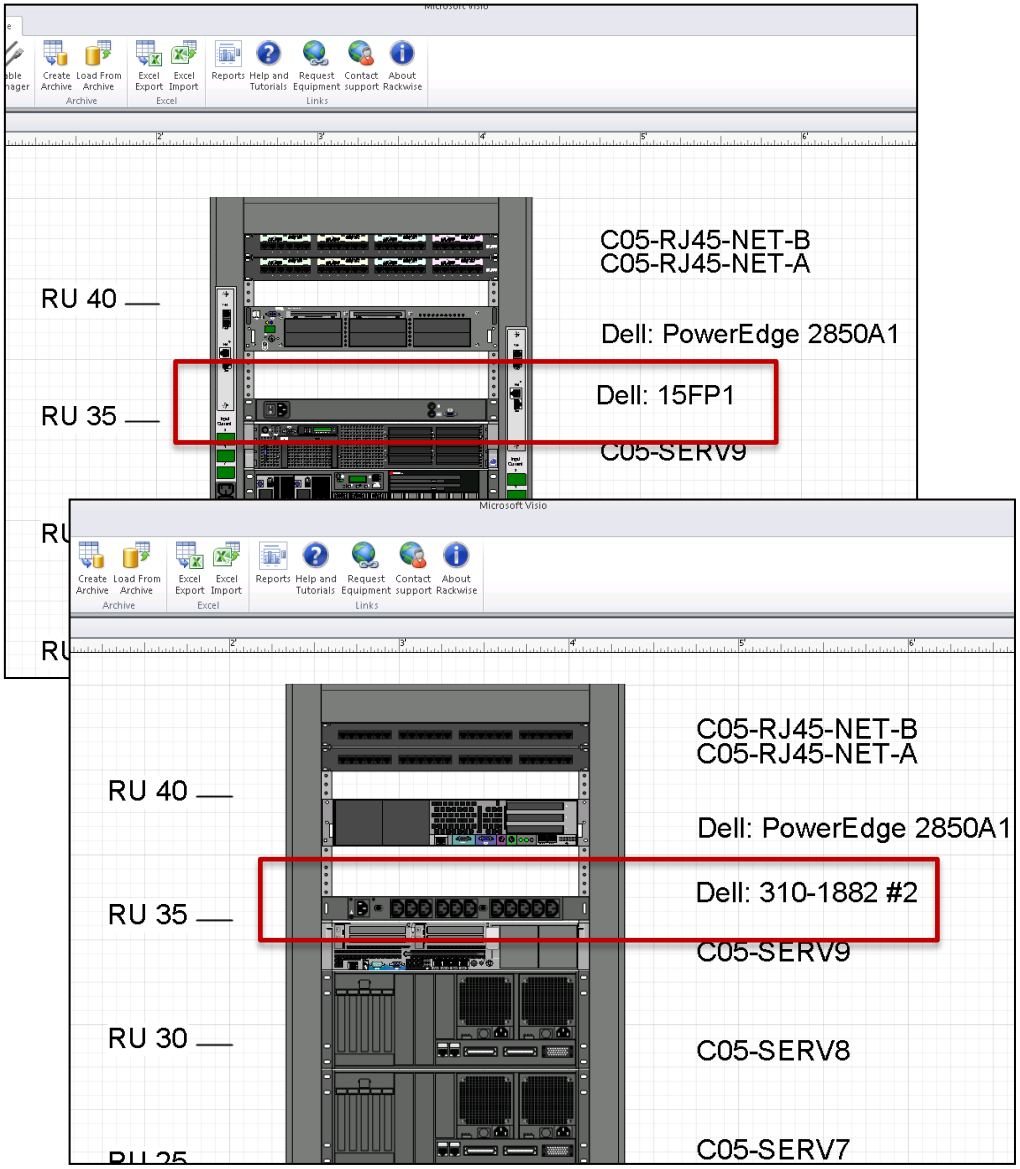
- Quickly and simply create a financial analysis of the data center using the Uptime Institute's Pit Turner financial model of the data center
- Report on Power Expenditures, Operational Costs, and Capital Costs
- Break down expenses by type of data center equipment
- Ad Hoc reporting, design your own customer reports with built-in Microsoft Report Builder



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Partial Depth Device Modeling

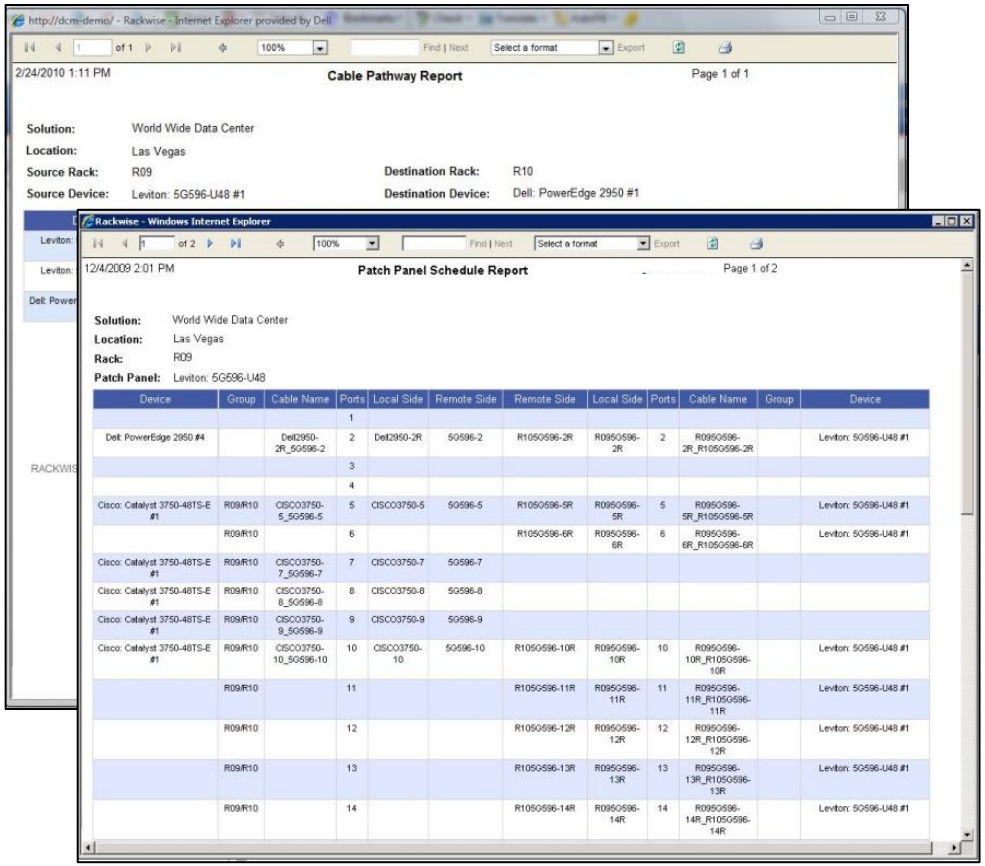
- Model:
  - Rack mounted devices mounted back-to-back within the same RU location
- Search:
  - Locate landing alternatives for devices based on contiguous RU and device depth in rack enclosures.
- Determine:
  - Optimal device location based on customized criteria including depth
  - Automatic device collision avoidance



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Cable Management Reports

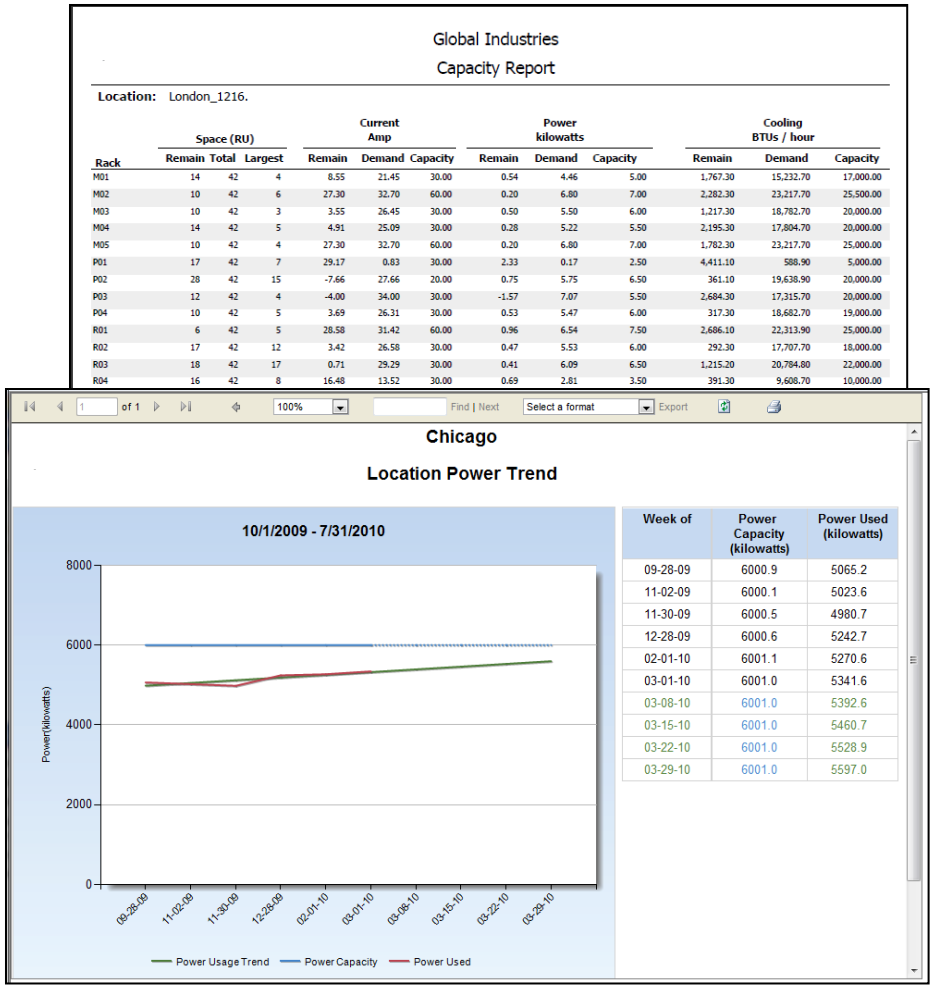
- Network Cabling
  - Document network cabling from port to patch panel, from patch panel to device.
  - Match cable type and network connector when configuring connections
  - Track cable pathways through multiple hops
  - Produce cable pathway reports
  - Patch schedules
  - Device Connectivity reports
- Power Cabling
  - Track power connectivity from source, public utility or generator, to/from ATS, UPS, PDU, RPP, breaker, and power strip



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Capacity Planning

- Calculate and Report:
  - On current consumption and remaining capacity of power equipment, circuits
- Search For:
  - Optimal placement of new equipment by specifying power, cooling, space, network port, power availability
- Determine and Plan For:
  - Future resource needs with trend, historical forecast
- Build Models Of Future Consumption:
  - Based on planned equipment adds and report on resource consumption and capacity



Global Industries

Capacity Report

Location: London_1216.

Rack	Space (RU)			Current Amp			Power kilowatts			Cooling BTUs / hour		
	Remain	Total	Largest	Remain	Demand	Capacity	Remain	Demand	Capacity	Remain	Demand	Capacity
M01	14	42	4	8.55	21.45	30.00	0.54	4.46	5.00	1,767.30	15,232.70	17,000.00
M02	10	42	6	27.30	32.70	60.00	0.20	6.80	7.00	2,282.30	23,217.70	25,500.00
M03	10	42	3	3.55	26.45	30.00	0.50	5.50	6.00	1,217.30	18,782.70	20,000.00
M04	14	42	5	4.91	25.09	30.00	0.28	5.22	5.50	2,195.30	17,804.70	20,000.00
M05	10	42	4	27.30	32.70	60.00	0.20	6.80	7.00	1,782.30	23,217.70	25,000.00
P01	17	42	7	29.17	0.83	30.00	2.33	0.17	2.50	4,411.10	588.90	5,000.00
P02	28	42	15	-7.66	27.66	20.00	0.75	5.75	6.50	361.10	19,638.90	20,000.00
P03	12	42	4	-4.00	34.00	30.00	-1.57	7.07	5.50	2,684.30	17,315.70	20,000.00
P04	10	42	5	3.69	26.31	30.00	0.53	5.47	6.00	317.30	18,682.70	19,000.00
R01	6	42	5	28.58	31.42	60.00	0.96	6.54	7.50	2,686.10	22,313.90	25,000.00
R02	17	42	12	3.42	26.58	30.00	0.47	5.53	6.00	292.30	17,707.70	18,000.00
R03	18	42	17	0.71	29.29	30.00	0.41	6.09	6.50	1,215.20	20,784.80	22,000.00
R04	16	42	8	16.48	13.52	30.00	0.69	2.81	3.50	391.30	9,608.70	10,000.00

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Chicago

Location Power Trend

10/1/2009 - 7/31/2010

Week of	Power Capacity (kilowatts)	Power Used (kilowatts)
09-28-09	6000.9	5065.2
11-02-09	6000.1	5023.6
11-30-09	6000.5	4980.7
12-28-09	6000.6	5242.7
02-01-10	6001.1	5270.6
03-01-10	6001.0	5341.6
03-08-10	6001.0	5392.6
03-15-10	6001.0	5460.7
03-22-10	6001.0	5528.9
03-29-10	6001.0	5597.0

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Professional Services



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End-to-End Professional Services



- **Discovery and Scope Assessment**
  - Requirements Assessment
  - Data Center Asset Assessment
  - Compliance Requirements Assessment
  - Optimization Assessment
- **Consulting Services**
  - Green Data Center Program Development
  - Certification and Compliance Readiness
  - Integrations and Customizations
  - Proof of Concept (POC) Engagements
- **Implementation Professional Service**
  - Project Management
  - Product Installation and Data Transition
  - Reconciliation Services (Data against Actuals)
  - Physical Audit and Cable Documentation
  - Report Automation and Customizations
- **Managed Services**
  - Monthly / Quarterly Asset Audit
  - Software Maintenance and Upgrades
  - Best-practices, Optimization and Efficiency
- **Training**
  - On-site Product Training
  - Executive and Technical Workshops
  - Refresher Demos and User-Groups
  - Train-the-Trainer Programs
  - Product Certification Programs
- **Partner Development**
  - Rackwise Certified DCIM Consultant, Installer
  - Pre-sales and Post-sales Support
  - Project Consulting and Management Assistance
  - Industry Workshops and DCIM Leader Forums

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