

CA Technologies Überblick DCIM

Hans-Peter Müller

agility
made possible™



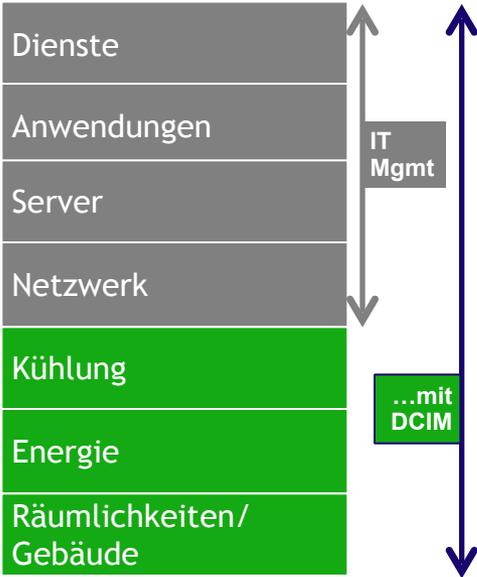
Data Center Infrastrukturmanagement



Mobilität **Soziale Netze** **Big Data** **Client Experience**

Platz **Energie** **Kühlung**

- RZ Bau
- Neugestaltung
- Konsolidierung
- Kooperation
- Cloud



CA DCIM

Überwachen

Verwalten

Steuern

DCIM

Power & Cooling

Monitor

Capacity & Inventory

Manage

Real-time

Data Collection
Analysis
Reporting
Alerting
Control

Physical

Lifecycle
3D Visualization
Asset Management
Capacity Analysis
Planning



Logical
Processes

Workflow

Resource Management

Business

Integration

IT Management & Business Services

Make Business
Relevant

Erfassung aller Daten



Infrastruktur

Kühlung

CRAC
CRAH

PDU
RPP

BMS 1

App 1

App 3

Generator

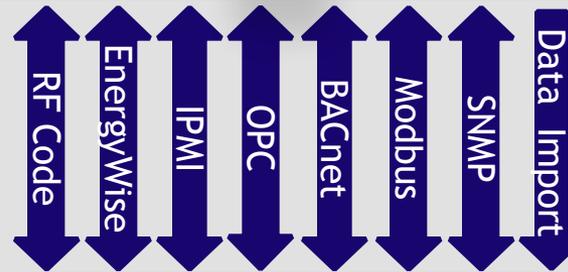
UPS

IT
Infrastruktur

BMS 2

App 2

Other



Software

DCIM
Information
Model

Gateway
Übersetzung / Normierung

Calculation Engine
flexible Echtzeitberechnung
Zur Analyse der Daten

Repository

- Software-basiert
- Multi-Site, Multi-Vendor, Multi-Protocol
- Definierbare Poll-Frequenz
- Normalisierung der Daten macht diese vergleichbar
- Eigene Formeln ermöglichen Berechnung beliebiger Kenngrößen

Informationen sammeln, speichern und korrelieren

- ✓ Gateway ermöglicht Kommunikation über viele Protokolle (SNMP, BACnet, Modbus, etc.)
- ✓ CA ecoSoftware MIB vereinheitlicht Sicht auf Daten
- ✓ Erweiterte Berechnungen

The screenshot shows the 'Gateway Explorer' application window. The left pane displays a tree view of a 'Demo Gateway' with various device categories: 'Poller Status', 'Resolved Mappings', 'Log', 'Modbus Devices' (expanded to show 'Trendpoint EnviroCube' and its sub-items like 'Internal Inlet Temp', 'Internal Inlet Humidity', 'Power Consumption', 'Airflow', 'Fan Speed', 'Remote Outlet Temp', 'Remote Outlet Humidity', 'Fan Speed Control'), 'Simulated PDU', 'BACnet Devices', 'SNMP Devices', 'Functions', and 'Calculations'. The right pane is titled 'Internal Inlet Temp' and contains the following configuration fields:

- Mapping Name: Internal Inlet Temp
- SNMP OID: 1.3.6.1.4.1.791.9.1.1.1.8.1.5.1
- OID Maps to:
- Modbus Table: 04 Input Registers (3x)
- Register Address: 5010
- Data Type: Integer (16-bit)
- Bit Position: 0
- Byte Order: Big Endian
- Word Order: Big Endian
- Mode: Read Only
- Value Expression: (empty field)

**Power &
Cooling**

Collect

Analyze

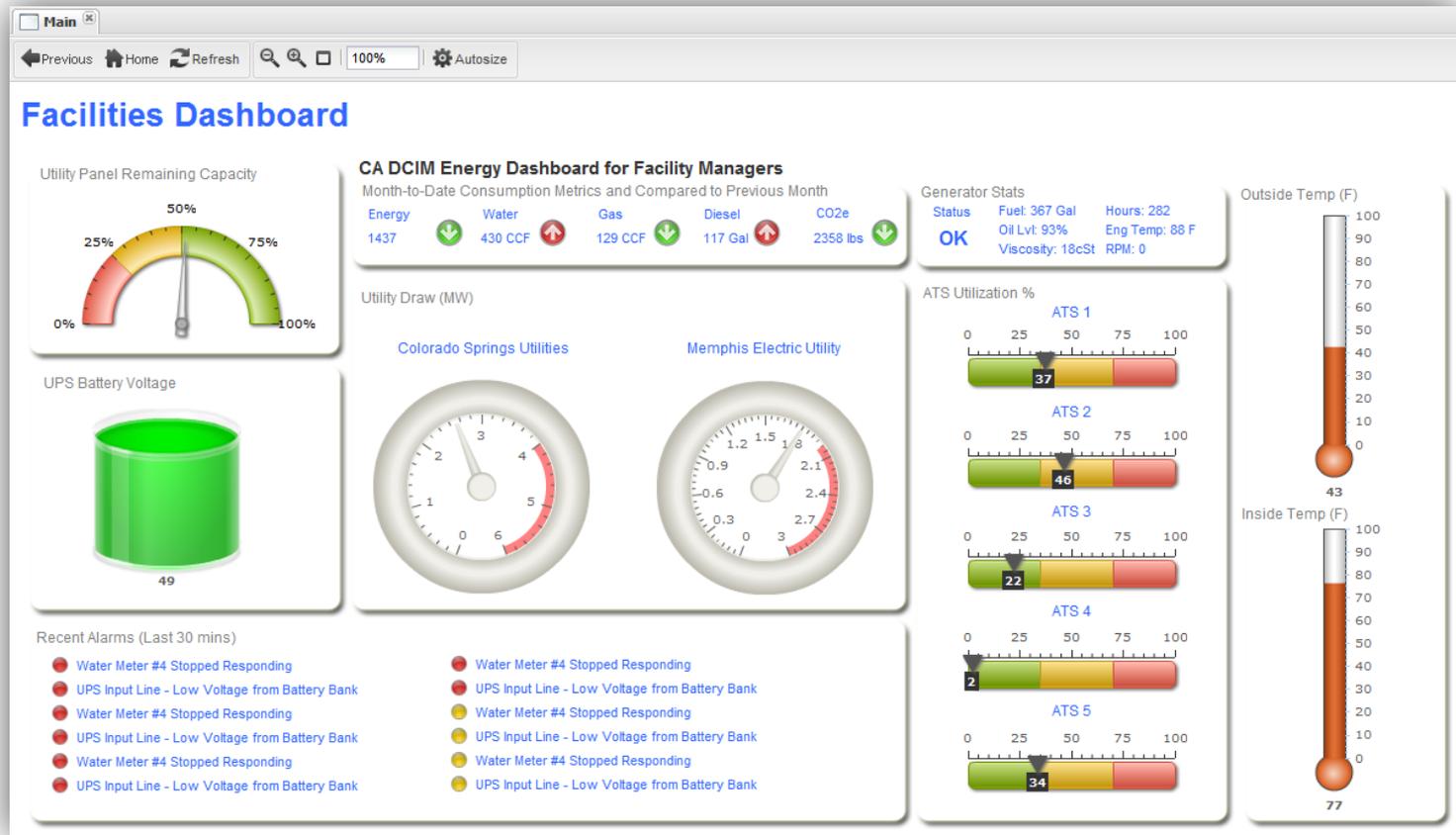
Report

Alert

Control

Echtzeitanalyse

- ✓ PDU Nutzung
- ✓ Auslastung der Energieversorgung
- ✓ Temperatur
- ✓ Lastverteilung, Phasenbalance, Stromverbrauch, ...

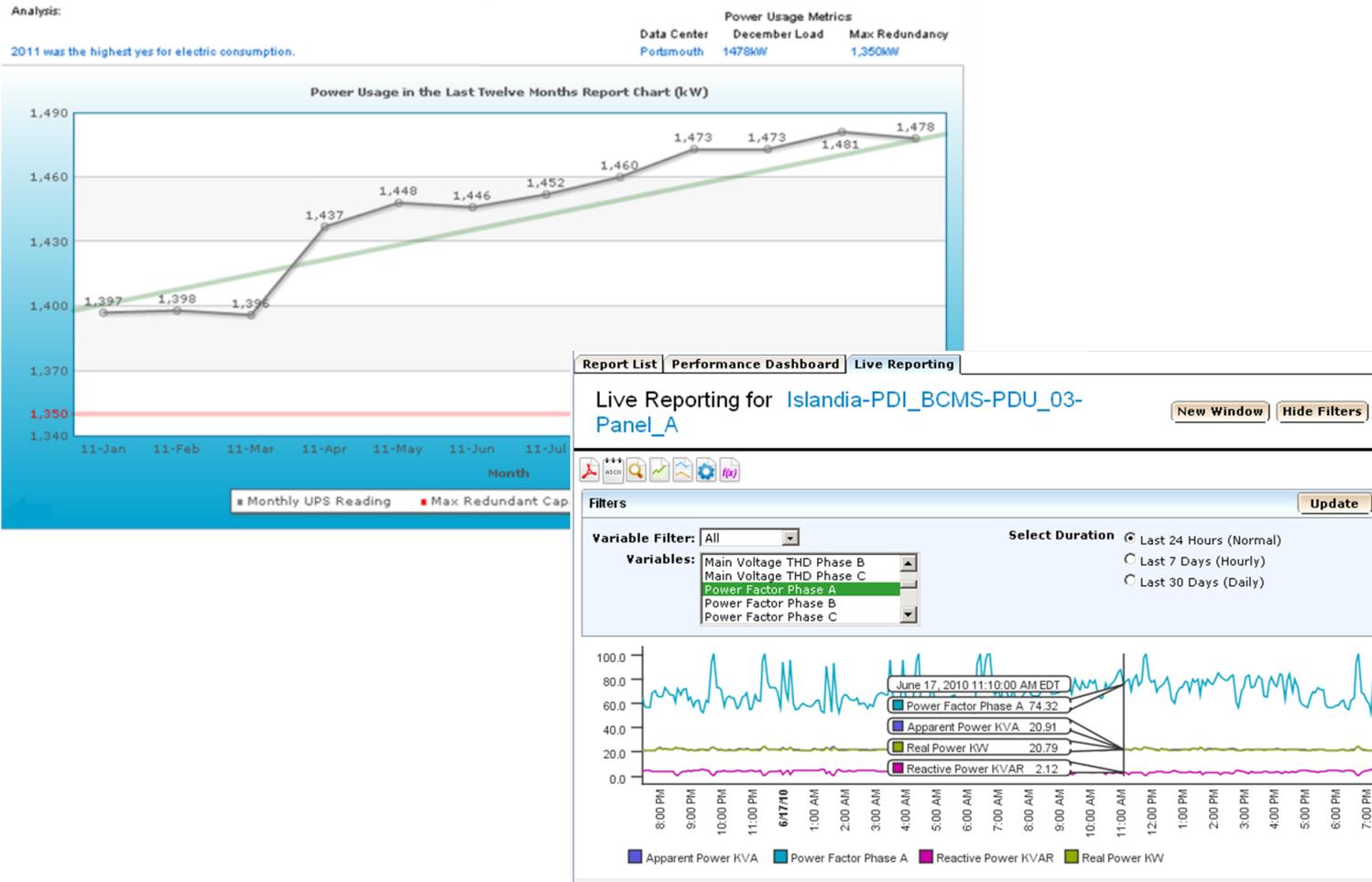


Power & Cooling

Collect Analyze Report Alert Control

Berichtswesen

- ✓ Zugriff auf alle Daten, incl. berechneter Werte
- ✓ Berichte über Energieverbrauch und entstehende Kosten pro Lokation, Gebäude etc.
- ✓ Standard: PUE, DCiE, SI-EER, IT-PEW, WUE, ERE, DCcE,....
- ✓ Eigene Anpassung: \$Revenue/Energy, BTUs/KW,...



Power & Cooling

Collect

Analyze

Report

Alert

Control

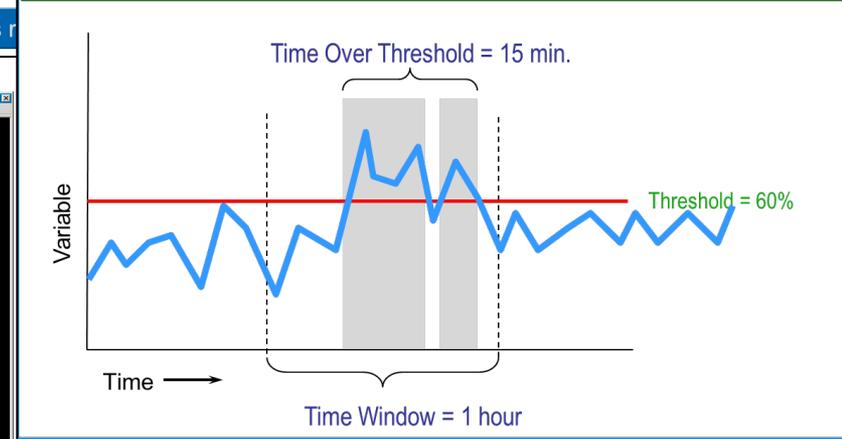
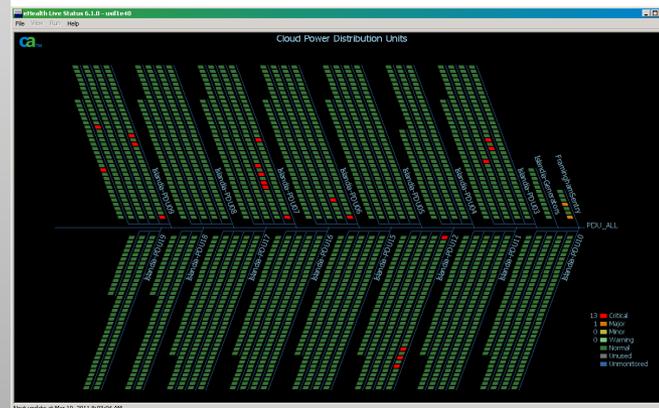
Intelligente Alarmierung

✓ Symptome erkennen, bevor Probleme entstehen

✓ Flexible Zeitfenster, Abweichung vom Normalzustand



Dynamically maintained baseline reflects business r



Natural Deduplication Reduces Noise

Power & Cooling

Collect Analyze Report Alert Control

Kontrolle

- ✓ VMs können zwischen Racks und Lokationen bewegt werden
- ✓ Power Capping Racks
- ✓ Aktives Power Mgt
- ✓ Regeln für Überwachung

The screenshot shows the "Rule Editor" window with the following settings:

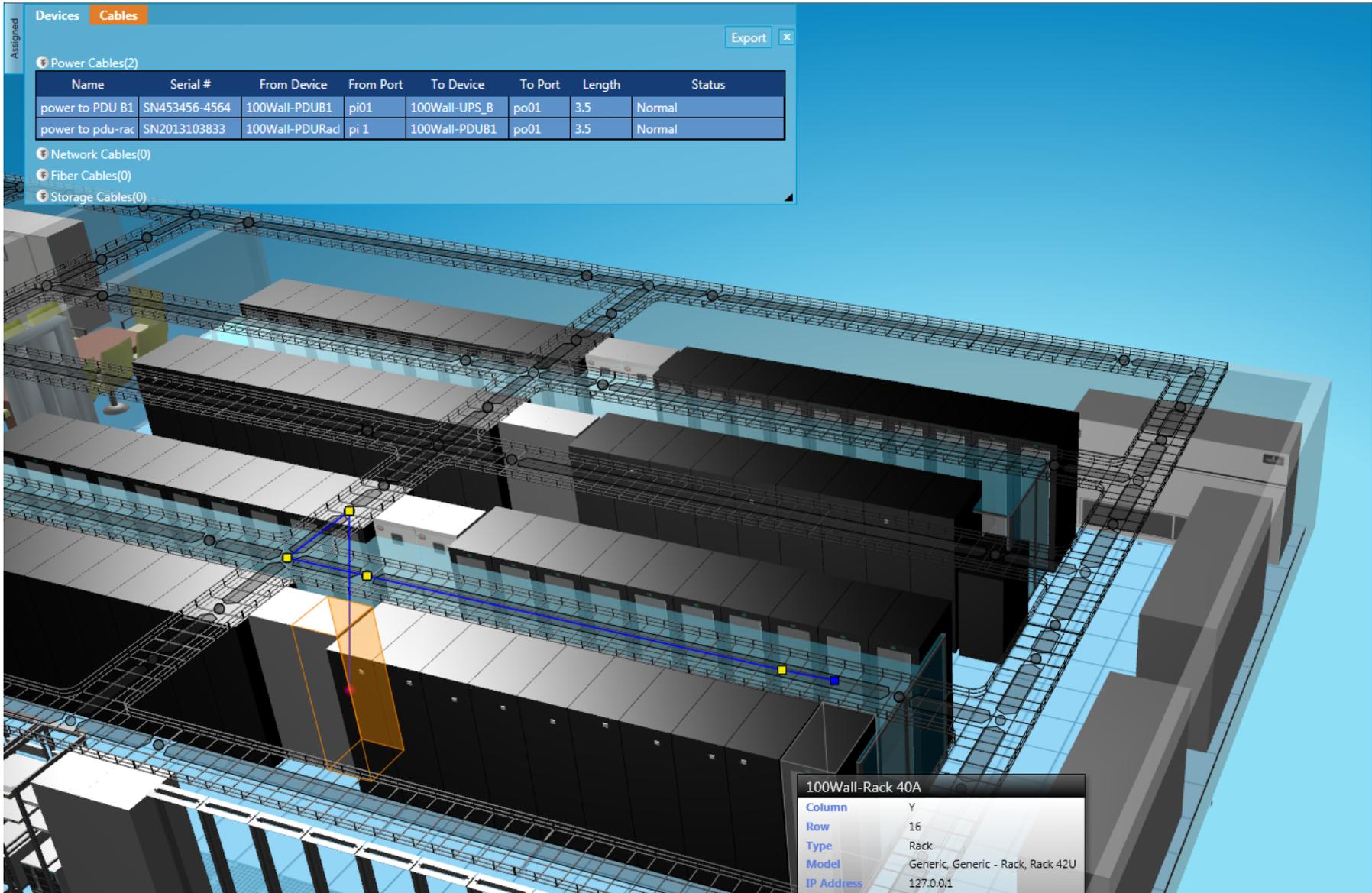
- Element Type:** Environmental Sensor
- Severity:** Warning
- Enable Rule:** checked
- Rule Message:** (empty)
- Rule Type:** Variable (selected), Availability, Reachability, Event, Polled (deselected)
- Time:** For 30 minutes out of 2 Hours
- Variable:** Output Load
- Condition Type:** Deviation From Normal
- Conditions:**
 - Above
 - Below
 - Outside
 - the Mean By 250
 - Deviation from Mean
 - Compare To
 - Same Hour and Day
 - Entire Baseline
 - Short-term Baseline
 - Mean Calculated Over 6 Weeks
- And
- Variable:** Air Flow
- Condition Type:** Time Over Threshold
- Below
- Above
- Threshold Of [] Cubic CM per Minute

Buttons at the bottom: OK, Apply, Cancel, Help...

Power & Cooling

Collect Analyze Report Alert Control

Darstellung der Kabel



Darstellung der Kabel

F1, 100 Wall St, New York, New York, United States, World

admin - CA VI4.6.01 2013-07-30 17:04 +02:00

Refresh Reset Zoom In Zoom Out

Go Back Go Forward Up One Level

Generate Humidity Generate Thermal

Alarms Normal Alarms Environment Sensor Flag VM Flag Floor Walls Room Name Fiber Channel Background Layer Filter Rack Capacity Cable Tray Cables

Add Layer Map Filtered View

Refresh Camera Control View Level Environment Show / Hide Layer

Devices **Cables**

Export

Power Cables(37)

Name	Serial #	From Device	From Port	To Device	To Port	Length	Status
New Cable		100Wall-ATS_A	pi1	100Wall-Generator	po1		
New Cable		100Wall-Swite-40A	pi 1	100Wall-PDURack	po 03		
New Cable		100Wall-DCM-Serv	pi 1	100Wall-PDURack	po 02		
New Cable		100Wall-BladeEnc	pi02	100Wall-PDURack	po 01		
New Cable		100Wall-BladeEnc	pi01	100Wall-PDURack	po 01		
power to ATS B	SN3546436-75656	100Wall-ATS_B	pi1	100Wall-Generator	po2	3.2	Normal
power to PDU A1	SN2345346	100Wall-PDUA1	pi01	100Wall-UPS_A	po 1	4.2	Normal
power to PDU A2	SN345345	100Wall-PDUA2	pi01	100Wall-UPS_A	po02	2.6	Normal
power to PDU A3	SN345345-5675	100Wall-PDUA3	pi01	100Wall-UPS_A	po03	3.4	Normal
power to PDU A4	SN345345-5675	100Wall-PDUA4	pi01	100Wall-UPS_A	po04	3.4	Normal

Network Cables(90)

Name	Serial #	From Device	From Port	To Device	To Port	Length	Status
Network to server	SN8736-7518	100Wall-Server806	ni 1	100Wall-Network-E	no 21	6.5	Normal
Network to server	SN8736-7529	100Wall-Server807	ni 1	100Wall-Network-E	no 09	5.2	Normal
Network to server	SN8736-7457	100Wall-Server800	ni 1	100Wall-Network-E	no 03	2	Normal
Network to server	SN8736-7458	100Wall-Server800	ni 1	100Wall-Network-E	no 04	2	Normal
Network to server	SN8736-7459	100Wall-Server800	ni 1	100Wall-Network-E	no 05	2.5	Normal
Network to server	SN8736-7460	100Wall-Server800	ni 1	100Wall-Network-E	no 06	5.6	Normal
Network to server	SN8736-7461	100Wall-Server800	ni 1	100Wall-Network-E	no 07	4.2	Normal
Network to server	SN8736-7462	100Wall-Server800	ni 1	100Wall-Network-E	no 08	4.2	Normal
Network to server	SN8736-7463	100Wall-Server800	ni 1	100Wall-Network-E	no 09	1.4	Normal
Network to server	SN8736-7464	100Wall-Server801	ni 1	100Wall-Network-E	no 10	3.5	Normal

Fiber Cables(0)

Storage Cables(0)

Floor:F1

Print

Reset CW CCW

Layer Dashboards Trend Charts Alarms File Depot

Platzierung und Kommissionierung

- ✓ Größere Effizienz durch automatisches Platzieren
- ✓ Automatische Zuweisung von Anschlüssen
- ✓ Reservierungen
- ✓ Servicepläne
- ✓ Kalender

The screenshot displays a software interface with two main sections for device 'pi01'. Each section contains a 'Port Assignment' table and a 'Port Summary' table.

Top Section Port Assignment:

Select	Power Strip	Power Phase	Port #
<input type="checkbox"/>	20120223-002	C	1
<input type="checkbox"/>	20120223-002	B	3
<input type="checkbox"/>	20120223-002	B	2
<input type="checkbox"/>	20120223-002	B	1
<input type="checkbox"/>	20120223-002	A	3
<input type="checkbox"/>	20120223-002	A	2
<input type="checkbox"/>	20120223-002	A	1
<input type="checkbox"/>	d1308	C	3
<input type="checkbox"/>	d1308	C	2
<input type="checkbox"/>	d1308	C	1

Top Section Port Summary:

	KW			Amps		
	Capacity	Static	Actual	Capacity	Static	Actual
PDU						
A	1.4	1.3	1.5	15	15	15
B	1.5	1.5	1.3	15	15	15
C	1.5	1.4	1.4	15	15	15
Total	4.3	4.2	4.4	15	15	15
Rack						
A	1.5	1.4	1.5	15	15	15
B	1.3	1.5	1.3	15	15	15
C	1.4	1.5	1.3	15	15	15
Total	4.2	4.1	4.4	15	15	15

Bottom Section Port Assignment:

Select	Power Strip	Power Phase	Port #
<input type="checkbox"/>	20120223-002	C	1
<input type="checkbox"/>	20120223-002	B	3
<input type="checkbox"/>	20120223-002	B	2
<input type="checkbox"/>	20120223-002	B	1
<input type="checkbox"/>	20120223-002	A	3
<input type="checkbox"/>	20120223-002	A	2
<input type="checkbox"/>	20120223-002	A	1
<input type="checkbox"/>	d1308	C	3
<input type="checkbox"/>	d1308	C	2
<input type="checkbox"/>	d1308	C	1

Bottom Section Port Summary:

	KW			Amps		
	Capacity	Static	Actual	Capacity	Static	Actual
PDU						
A	1.3	1.5	1.4	15	15	15
B	1.4	1.4	1.3	15	15	15
C	1.5	1.3	1.4	15	15	15
Total	4.3	4.2	4.4	15	15	15
Rack						
A	1.5	1.4	1.4	15	15	15
B	1.4	1.5	1.3	15	15	15
C	1.4	1.3	1.4	15	15	15
Total	4.5	4.3	4.4	15	15	15

Navigation buttons: Back, Next, Finish, Cancel.

Kapazität & Inventar

Commission

Impact

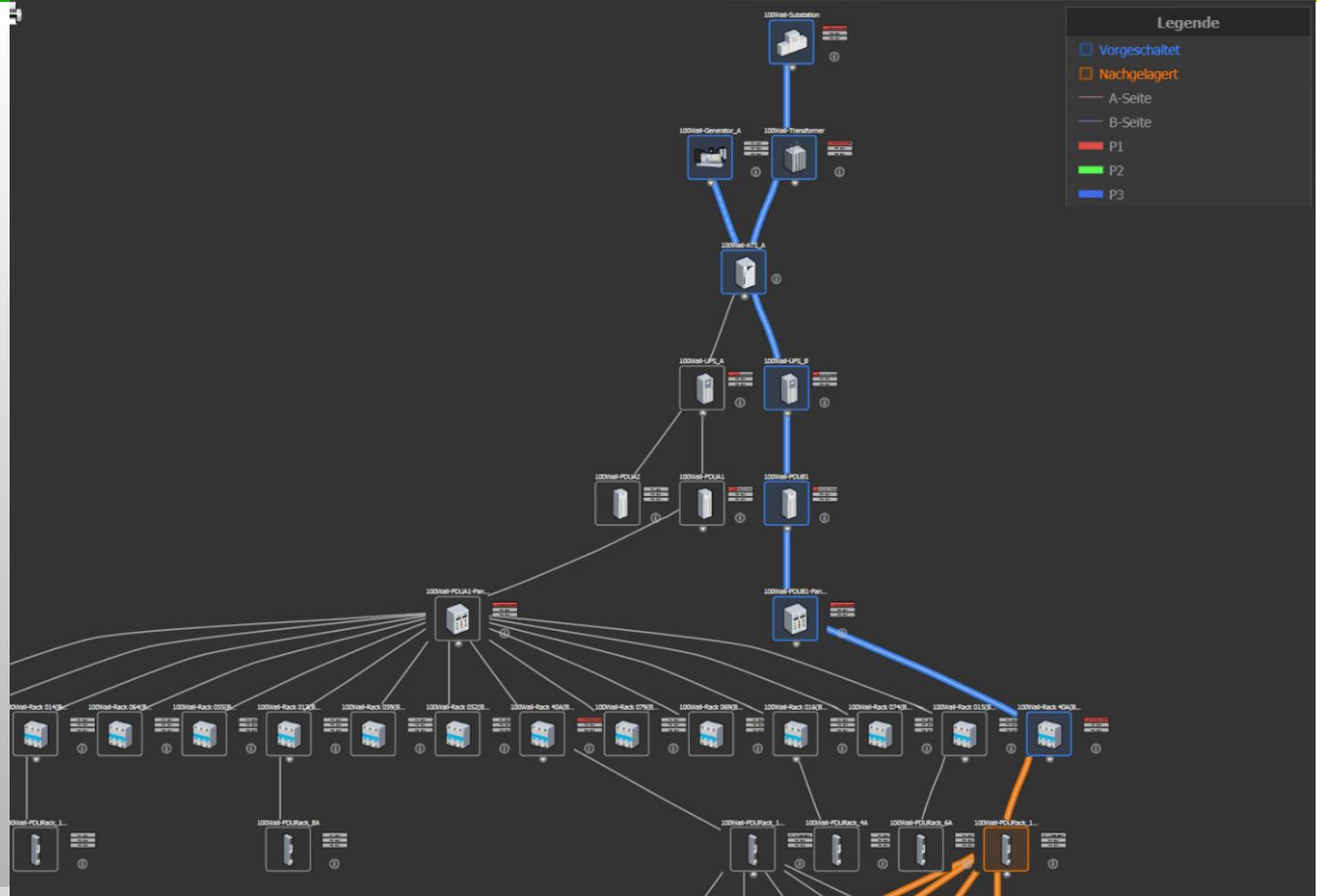
Capacity

Asset

What-if

Abhängigkeiten für Ursachen- und Auswirkungsanalyse

- ✓ Abhängigkeiten für Auswirkungsanalyse
- ✓ Kapazität und Verbrauch in Echtzeit
- ✓ Ursachenanalyse



Kapazität & Inventar

Commission

Impact

Capacity

Asset

What-if

Kapazitätsmanagement und Kapazitätsplanung

- ✓ Platz
- ✓ Energie
- ✓ Kühlung
- ✓ Kapazität

Raum-Zusammenfassung

Gesamt/Doppelboden-Bereich (m2)	506,81/256,93	Verwendete Stromports (Ist-Wert/%)	0 (10 / 20,83%)
Grauer/Weißer Bereich (m2)	352,98/153,82	Verfügbare Stromports (Ist-Wert/%)	48 (38 / 79,17%)
Gesamt Racks	106 (106)	Gesamt Netzwerkports	2299 (2299)
Gesamt Front-Rack U	4.495 (4495,0)	Verwendete Netzwerkports (Ist-Wert/%)	0 (10 / 0,43%)
Verwendetes Front-Rack U (Ist-Wert/%)	562,0 (572,0 / 12,73%)	Verfügbare Netzwerkports (Ist-Wert/%)	2299 (2289 / 99,57%)
Verfügbare Front-Rack-U (Ist-Wert/%)	3.933,0 (3923,0 / 87,27%)	Gesamt Speicherports	0 (0)
Gesamt Stromports	48 (48)	Verwendete Speicherports (Ist-Wert/%)	0 (0)
		Verfügbare Speicherports (Ist-Wert/%)	0 (0)

Strom-Zusammenfassung

Gesamt UPS-A-Strom (kW)	200,00 (200,00)	Gesamt UPS-B-Strom (kW)	200,00 (200,00)
Verwendeter UPS-A-Strom (kW/%)	0,00 (1,28 / 0,64%)	Verwendeter UPS-B-Strom (kW/%)	0,00 (1,28 / 0,64%)
Verfügbare UPS-A-Leistung (kW/%)	200,00 (198,73 / 99,36%)	Verfügbare UPS-B-Leistung (kW/%)	200,00 (198,73 / 99,36%)
Gesamt Protokolldateneinheits-A-Strom (kW)	100,00 (100,00)	Gesamt Protokolldateneinheits-B-Strom (kW)	100,00 (100,00)
Verwendeter Protokolldateneinheits-A-Strom (kW/%)	0,00 (1,28 / 1,28%)	Verwendeter Protokolldateneinheits-B-Strom (kW/%)	0,00 (1,28 / 1,28%)
Verfügbare PDU-A-Leistung (kW/%)	100,00 (98,73 / 98,73%)	Verfügbare PDU-B-Leistung (kW/%)	100,00 (98,73 / 98,73%)
Gesamt Rackmount-PDU-A-Strom (kW)	208,00 (208,00)	Gesamt Rackmount-PDU-B-Strom (kW)	208,00 (208,00)
Verwendeter Rackmount-PDU-A-Strom (kW/%)	1,08 (2,36 / 1,13%)	Verwendeter Rackmount-PDU-B-Strom (kW/%)	0,00 (1,28 / 0,61%)
Verfügbare Rackmount-PDU-A-Leistung (kW/%)	206,92 (205,65 / 98,87%)	Verfügbare Rackmount-PDU-B-Leistung (kW/%)	208,00 (206,73 / 99,39%)

Kühlungsübersicht

Gesamtanzahl der CRAC-Einheiten	7,00
Gesamt Kühlung BTU	0,00
Gesamtkühlung in Tonnen	120,00
Erforderliche Kühlung in Tonnen (Tonnen)	1.234,80
Verwendung der Kühlung (Tonnen/%)	1.029,00

Kapazität & Inventar

Commission

Impact

Capacity

Asset

What-if

Arbeitsaufträge



Work Order : New Work Order

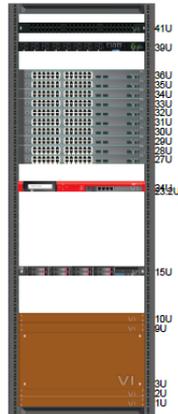
Work Order Id : #156265

Created By : admin

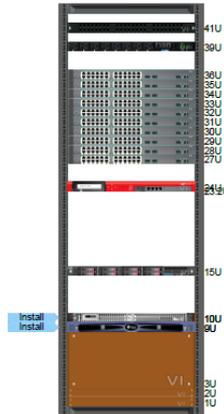
Assigned To :

Created Date : January 13, 2014 15:59:32

Current View



Planned View



Rack	100Wall-Rack_20
Model Name	Rack 42U, Generic - Rack, Generic, Rack
Row/Column	13/Y
Location	Data Center, F1, 100 Wall St, New York, New York, United States, World

#New Work Order

No.	1
Action	Install(Equipment Install, Provisioning Power, Provisioning Network)
Device	100Wall-AutoServer 02
Model Name	1950, PowerEdge, Dell, Server - Rackmount
Serial Number	
Asset Tag	
U Position	10
Power Port	Port pi 1 <---> [100Wall-PDURack_1A] Port po 04
Network Port	Port ni 1 <---> [100Wall-Switch1] Port no 04
Fiber Port	

No.	2
Action	Install(Equipment Install, Provisioning Power, Provisioning Network)
Device	100Wall-AutoServer 01
Model Name	3120, StorEdge, Sun, Server - Rackmount
Serial Number	
Asset Tag	
U Position	9
Power Port	Port pi 1 <---> [100Wall-PDURack_1A] Port po 03
Network Port	Port ni 1 <---> [100Wall-Switch1] Port no 03
Fiber Port	

Kapazität und Kommissionierung



Server
Racks
Kunden



Erkennen
Überwachen
Trends

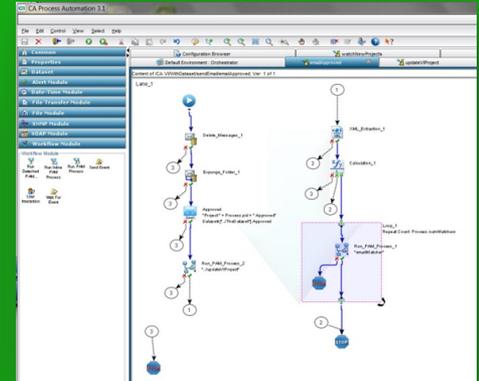


RZ Planung

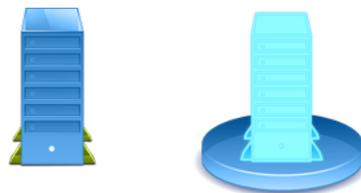
Integration in Prozessautomation

Project Wizard Tool

Project Name	Status	Owner	Department	Start Date	End Date	Total Device #	Total RU	Total Power	Total Power Ports	Total Network
CA-20 Server Install	Deployed	Install Team	Support	2012-05-01	2012-05-31	20	20	13.40 KW	40	40
CA-22 Server Installation	Deployed	Install Team	ecosoftware	2012-06-18	2012-06-26	4	16	4.40 KW	8	16
Customer 3 - 30 - DL580G7	Pending	Install Team	Support	2012-06-30	2012-07-28	30	120	34.83 KW	120	120
Deployment of 10 racks	Pending	Install Team	ecosoftware	2012-07-06	2012-07-07	10	10	2.75 KW	20	20
CA 5 Server Installation	Reserved	Install Team	ecosoftware	2012-07-09	2012-07-09	2	8	2.20 KW	4	8
Rack 40A	Pending	Install Team	ecosoftware	2012-07-09	2012-07-11	1	4	1.10 KW	2	4
New Server placement	Pending	Install Team	ecosoftware	2012-07-17	2012-07-17	1	4	1.10 KW	2	4
Technology refresh	Pending	Install Team	ecosoftware	2012-08-21	2012-12-31	50	100	42.85 KW	100	200



Prozessunterstützung



Physikalisch und Virtuell



Überwachung
kritischer
Anwendungen

Projekte

The screenshot displays the CA Visual Infrastructure application interface. The main window is titled 'Hardware-Installation' and shows the following details:

- Name:** Hardware-Installation
- Buttons:** Set Location, Auto Plan, Result Details, Submit Actions
- Plan Result Details [100Wall-AutoServer 01 - Server - Rackmount - 3120]** (Close Details)
- Table:**

Operation	Name	Type	Model	Vendor	Product Line	U Position
Selected	100Wall-Rack_20	Rack	Rack 42U	Generic	Generic - Rack	9.0
Change Rack	LPAR-rack	Rack	Rack 25U	Generic	Generic - Rack	
Change Rack	100Wall-Rack 40A	Rack	Rack 42U	Generic	Generic - Rack	

Power Port Connections

pi 1

Power Port Assignment

Select	Power Strip	Port #
<input type="checkbox"/>	100Wall-pdu	
<input checked="" type="checkbox"/>	100Wall-PDURack_1A	po 03
<input type="checkbox"/>	100Wall-PDURack_1B	

Power Summary

Device Name	kW			Amps		
	Capacity	Static	Actual	Capacity	Static	Actual

Current DCIE	0.52	Total / Raised Floor Area	628.66 / 256.93 m ²
IT Power	350.81 kW	Grey / White Area	366.91 / 261.75 m ²
Total Power	670.30 kW	Kilowatts per Area	1.07 kW/m ²
Estimated Yearly Power Consumption	5,871,828.00 kWh	Total / Managed Racks	113 / 90
Estimated Yearly Cost	\$1,174,365.60	Total Devices	637
Estimated Yearly CO2 Emission	3,969.36 Tons	Total Monitored Devices	12

Was wäre wenn?

- ✓ Was wäre wenn Abfragen
- ✓ Zustand mit neuen Geräten untersuchen
- ✓ "Wie viele" Analysen erlauben, Grenzen der Umgebung zu finden.

The screenshot shows the 'Kapazitätsplaner' software interface. On the left, a tree view shows a location hierarchy: World > Deutschland > Darmstadt > Marienburgstr. 35 > grda-FL01 > GRDA-KG01. The main panel is titled 'Nach Modell' and shows configuration for a 'Server - Rackmount' by Fujitsu, model 'PRIMERGY RX Series', specifically 'RX330'. The quantity is set to 5. The 'A-B-Seite - Leistung' is 'A-B Side Power' with a power of 0,51 kW. Network ports are set to 2, storage ports to 0, and power ports to 2. A table in the top right corner shows the configuration for the installed units:

Aktion	Menge	kW	Rack U	Netzwerk-Ports	Speicher-Ports	Strom-Ports	A-B-Seite
Install	5	0,51	2,0	2	0	2	AB

Buttons for 'Hinzufügen', 'Löschen', and 'Leeren' are visible. At the bottom, there are buttons for 'Analyse', 'Erweitert', and 'Drucken'. A section titled 'Standort-Energie-Information' provides the following data:

Metric	Value	Target/Comparison
Aktueller PUE-Wert	1,91	(1,90)
Aktueller DCIE-Wert	0,52	(0,53)
IT-Leistung (kW)	351,11	(353,66)
Gesamt Strom (kW)	670,30	
Geschätzter jährlicher Stromverbrauch (kWh)	5.871.828,00	
Voraussichtliche Jahreskosten (\$)	1.174.365,60	
Geschätzte jährliche CO2-Emission (Tonnen)	2.736,27	

Capacity & Inventory

Commission

Impact

Capacity

Asset

What-if

Initiativen unterstützt von DCIM

LOWER RISK

Create standard and custom metrics such as PUE, so you can benchmark your data center, facilities equipment and IT assets to find energy savings

IMPROVE CAPACITY

Collect data from multiple sources and from devices supplied by a very wide range of vendors, so you can maximize your value and use a single system

IMPROVE EFFICIENCY

Control both physical equipment and virtual environments, to achieve greater savings

- Zentrales Data Center Infrastructure Management (Power, Cooling, Space, etc.)
 - Eine Lösung (CA DCIM) statt Spreadsheet und andere für Management & Planung
- Alert/Event Management
- ‚Trusted Source‘ für Data Center Assets
- Keine Zeichnungen für CA DCIM notwendig
- Kurze Implementierungszeit
- Keine HW/Device Abhängigkeit

Warum CA?

- Detailliertes Verständnis und Know How über IT Prozesse und Anforderungen
- Gesamtheitliche Betrachtung der Aufgabenstellung (ITSM, Alarm/Event Management, Asset Management, usw.)
- Verständnis und Wissen über die notw. Integrationen zur Einbettung von CA DCIM in den Gesamtkontext

Vielen Dank!