StruxureWare for Data Centers

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DCIM Definition

- **DCIM Data Center Infrastructure Management**
  - Multifunctional, has numerous subsystems
  - Attempts to address various technical and business issues
  - Different names
    - Datacenter efficiency software
    - Operational technology
    - Datacenter management (DCM)
    - Datacenter operational management (DCOM).

- Collects and manages information about a datacenter’s assets, resource use and operational status
  - This information is then distributed, integrated, analyzed and applied in ways that help managers meet business and service-oriented goals and optimize the datacenter’s performance

- Primarily concerned with managing or modeling datacenter infrastructure
  - Including software that has a direct bearing on IT equipment power consumption
DCIM features

- Monitoring, Measuring and Alerting
  - Centralized monitoring

- Decision Support and Information Management
  - Asset management
    - Inventory
  - Planning
    - Scenario Analysis, Master plans
  - Change and Configuration management
    - Execution of plans
  - Capacity and Energy management
    - Maximizing capacity and energy optimization

- Management and Control
  - Automated management and control
  - Fault-tolerant (fail-over)

- Software Services
  - Installation, Commissioning, Educational, Entitlement etc.
  - Project management and Customization

Source: APC by Schneider Electric – Name – Date
# DCIM Components

<table>
<thead>
<tr>
<th>DCIM Component</th>
<th>Specific Functionality</th>
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<tbody>
<tr>
<td>Monitoring</td>
<td>• Meter and sensor hardware</td>
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<tr>
<td></td>
<td>• Environmental monitoring and alarming</td>
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<td>• Maintenance monitoring and alarming</td>
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<tr>
<td></td>
<td>• Power/energy measurement and (non-predictive) modeling</td>
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<tr>
<td>Control</td>
<td>• Power control</td>
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<td></td>
<td>• Closed-loop cooling control</td>
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<td></td>
<td>• IT power management, power scaling, power capping</td>
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<td></td>
<td>• (Real-time) IT optimization, moving IT loads</td>
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<tr>
<td>Datacenter planning and non-real-time optimization</td>
<td>• Capacity planning, forecasting</td>
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<td></td>
<td>• CFD (ongoing operational capabilities)</td>
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<td>• Datacenter performance simulation</td>
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<td>Data management, integration and reporting</td>
<td>• Data management, integration and reporting</td>
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<tr>
<td>Asset, configuration and change management</td>
<td>• Asset, configuration and change management</td>
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DCIM Offer in the market

- **Suite providers**
  - Must provide a full complement
    - Asset management capabilities
    - Environmental / energy monitoring
    - Data aggregation / reporting as part of its DCIM offering

- **Non-Suite and point product providers**
  - The offer is a piece or pieces of the DCIM stack
    - But do not bring a full complement to market at this time

<table>
<thead>
<tr>
<th>DCIM SUITE PROVIDERS</th>
<th>NON-SUITE AND POINT-PRODUCT PROVIDERS</th>
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<tbody>
<tr>
<td>Emerson</td>
<td>1E</td>
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<td>iTRACS</td>
<td>Ad Infinitum Multimedia</td>
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<td>nlyte Software</td>
<td>Align</td>
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<td>No Limits Software</td>
<td>AssetGen</td>
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<td>Optimum Path Systems</td>
<td>CA Technologies</td>
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<td>Panduit</td>
<td>Concurrent Thinking</td>
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<td>Rackwise</td>
<td>Eaton</td>
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<td>Raritan</td>
<td>EnergyWare</td>
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<td>RF Code</td>
<td>FieldView Solutions</td>
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<td>Schneider Electric (APC)</td>
<td>Future Facilities</td>
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<th>Geist Intelligent Facilities</th>
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<td>Power Assure</td>
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<td>Racktivity</td>
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<td>TendPoint Systems</td>
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<td>Vigilient (Federspiel Controls)</td>
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<td>Viridity Software</td>
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Source: A51 Research
DCIM Market Trends

- Market is estimated to grow
  - From $240m 2011 to $1.2 billions in 2016
- DC where facilities and IT meet to think about the business
- Inhibitors to adoption
  - Cost and functionality issues
  - Difficulty of creating and maintaining asset databases
  - Widespread belief that it is possible to manage DC without physical infrastructure management tools
    - APC White Paper 150
- Energy savings from well-managed data centers
  - Reduce operating expenses by 20%
DCIM Response to new trends and needs

- Agile, Efficient and Available Data Centers
- Low TCO
- Real-time informed decision making
- Standardized integrated software solutions

- Regulatory/Compliance
- Energy Efficiency/Green
- Complexity
- Virtualization/Integrations
- Tracking & Documentation
- Co-location

- Availability
- Agility
- TCO
- Energy Efficiency

- System, Services & Software
- OS, Virtualization, Load Mgmt
- IT Hardware
- Power, Distribution & Cooling
- Building & Building Management

- Intelligent market expansion
- New sales and service model
- Innovative product offer
- Hyper productive global R&D organization

APC by Schneider Electric – Name – Date
DCIM StruxureWare

Facility Cooling Monitoring (Continuum/Vista)

Remote Energy Monitoring

Energy Dashboard

Facility Power Monitoring (ION Enterprise)

StruxureWare Central (Infrastruxre Central)

StruxureWare Operations (Infrastruxre Operations)

StruxureWare for Data Centers™ Management Software suite
What is StruxureWare for Data Centers

- **Definition**
  - Management software suite
  - Monitor and manage the operational side of the Data Center Facility and the Data Center IT Infrastructure
  - Address the individual and cross functional needs of users and groups

- **Focus**
  - Provide Data Center users the opportunity for improved continuity and collaboration across the traditional silos

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**Data Center Management**

- **Facility Power Monitoring**
- **Facility Cooling Monitoring**
- **IT Infrastructure Monitoring**
- **IT Infrastructure Operations**

Data Center Facility Management (DCFM)  
Data Center Infrastructure Management (DCIM)

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StruxureWare Management software

Schneider Electric

Energy and Sustainability Management
Baseline Benchmark Target Verify

Data Center Facility Management (DCFM)
Data Center Power, Cooling & Security
Collect Data Track Assets Assess
Automate Implement Virtualize

Data Center Infrastructure Management (DCIM)
Data Center Operations
Track Asset Simulate Plan
Implement Verify

IT Service Management (ITSM)*
IT Servers, Storage, Applications
Vendors and Schneider Electric Partners

Partners

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How it works

- **Analytics & Intelligence**
- **Centralized Monitoring**
- **Physical Infrastructure**

StruxureWare Operations

StruxureWare Central

Cisco UCS Manager

StruxureWare Operations

Cisco UCS Manager Plug-in
StruxureWare Management Software Suite

**Energy and Sustainability Management**
- **Sustainability** (New in 2012)
- **Remote Energy Monitoring**
- **Remote Monitoring Services**
- **Energy Dashboard**

**Data Center Facility Management (DCFM)**
- **Data Center Power, Cooling & Security**
  - StruxureWare Central (InfraStruxure Central)
  - Facility Power Monitoring (ION Enterprise)
  - Facility Cooling Monitoring (Continuum/Vista)

**Data Center Infrastructure Management (DCIM)**
- **Data Center Operations**
  - StruxureWare Operations (InfraStruxure Operations)

**IT Service Management (ITSM)**
- **IT Servers, Storage, Applications**
- **Other Vendors and Partners**
  - Cisco
  - HP
  - VMWare
  - Microsoft
  - Etc

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APC by Schneider Electric – Name – Date
What does StruxureWare for DC cover

Data Center Facility Management (DCFIM)
- **StruxureWare Central**
  Centralized management of critical physical infrastructure
- **StruxureWare Power** (**ION Enterprise**)  
  Electrical power and energy and power quality monitoring from Utility to rack
- **StruxureWare Cooling** (**Continuum**)  
  Monitoring and automation of the core thermal plant and cooling distribution system

Data Center Infrastructure Management (DCIM)
- **StruxureWare for Data Centers: Operations Suite**
  Asset management and documentation of data center operations through inventory management
- **StruxureWare Operations: Change**
  Fully integrated workflow management for your IT physical infrastructure
- **StruxureWare Operations: Capacity**
  Simulation, planning, and optimization of infrastructure capacities to right-size the data center
- **StruxureWare Operations: Energy Efficiency**
  Intelligent PUE analytics at subsystem level
- **StruxureWare Operations: Energy Cost**
  Instant overview of rack energy usage
- **StruxureWare Central: Mobile**
  Wireless operations of your data center
- **StruxureWare Operations: Insight**
  Comprehensive tool for customizing report designs to visualize data
- **StruxureWare Operations: Vizor**
  High level values of data center utilization at a glance
StruxureWare™ Central

- End to end data center infrastructure management software
  - Monitoring and control of power, cooling, security and energy usage
  - Through IT systems
- Data Center management
  - From rack to row to room to building
- Scalable monitoring system which collects, organizes, and distributes critical alerts, surveillance video and key information
  - Providing a unified view of complex physical infrastructure environments from anywhere on the network

iPhone app.
Blackberry app.
StruxureWare Power (ION Enterprise)

- Primary Function (ION Enterprise)
  - Monitor and analyze the complete power distribution infrastructure of your facility
  - Manage the electrical infrastructure from the utility feed to the rack
  - Address the information and analysis of facility electrical distribution
  - Tailored data center reports and a specialized graphics package
- Reduce electrical power and other energy related capital and operational costs
StruxureWare Cooling (Continuum)

- **Primary Function (Continuum/Vista)**
  - Manage and automate the cooling infrastructure from the chiller plant to the IT infrastructure piping
  - Specific application of cooling system automation for facility HVAC experts and mechanical engineers

- **Automated and manual control, for even the most complex Data Center HVAC and cooling management needs**
  - Designed for very detailed task, or they can be deployed as a more comprehensive facility management tool
Data Center Infrastructure Management (DCIM)

- Sustainability (New in 2012)
- Remote Energy Monitoring Services
- Energy Dashboard

Data Center Facility Management (DCFM)
- Data Center Power, Cooling & Security
  - StruxureWare Central (InfraStruxure Central)
  - Facility Power Monitoring (ION Enterprise)
  - Facility Cooling Monitoring (Continuum/Vista)

Data Center Infrastructure Management (DCIM)
- Data Center Operations
  - StruxureWare Operations (InfraStruxure Operations)

IT Service Management (ITSM)*
- IT Servers, Storage, Applications
- Other Vendors and Partners
  - Cisco
  - HP
  - VMWare
  - Microsoft
  - Etc

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DCIM Modularized Scalable Architecture

Enhancement Options

Product Modules

Operations platform

Virtualization layer

Licenses

Hardware

VIZOR

VIRTUAL

MOBILE

DASHBOARD

CAPACITY

CHANGE

ENERGY EFFICIENCY

ENERGY COST

INSIGHT

OPERATIONS

Redhat JBoss

Debian OS

VMWare, HyperVisor, Xen, KVM

PostgreSQL Database

Cluster node license

Server 1

Server 2

Server 3

Server 3
StruxureWare Operations

Primary Function
Manage, integrate, planning and implementation workflow

Customizable view
Organized in regions, countries, campus, sites, buildings and rooms

Inventory management
Shows device data within the physical layout
Instant access to device details and asset attributes

PUE calculator
Daily utilization of energy

Network management
DC network paths and their interconnections
Patch panel to patch panel mapping

Alarms within physical layout
Real-time device failures within floor layout
Rack front view for status of data center operations

User Rights Management
Individual user rights and controls
Capacity for Data Centers

**Physical equipment planning**
Locate the optimum spot for next server based on physical infrastructure needs

**Airflow analysis**
Simulate any cooling scenario
Visualizing the cooling effect on the infrastructure

**Available capacity**
Understand available capacity by calculating space, power and cooling consumption
Floor, power and network port availability
Rack weight limits against data center architecture

**Simulation of device failures**
Identify how a device failure will impact business critical applications

**Power failure to IT impact**
Critical events are translated into server impact analysis
Virtual machines at risk are automatically migrated to healthy hosts.

**Virtualization Capabilities**
Integrations with VMware vSphere and Microsoft System Center VMM
Change for Data Centers

Automated work order process
Create work orders and automatically generate tasks to move, add or change IT equipment
Schedule, assign and track the status of itemized tasks to implement changes

Space reservation
Reserve rack space for new equipment to be installed quickly and easily

Asset audit trail
Track asset moves, adds and changes by date/time, owner and work orders for view, print and export

Schedule of changes
View agenda of pending changes to assist time management and workload balancing

Custom tasks
Specify the activities required to fulfill the needs of the individual work order
Energy Efficiency for Data Centers

**Energy efficiency analysis**
Current and historical PUE/DCiE based on the current IT-load
For understanding energy efficiency at the facility level

**Subsystem losses**
Provides insight into energy losses and cost of energy at subsystem level
Provide details of which subsystem draws the most costs

**Web-enabled interface**
Easy integration with 3rd party web page through application programming interface (API)

**PUE report**
Provides a report on current & historical PUE values
Showing the effect of changing seasons and suitable for both internal and external display.

**Multi-vendor data integration**
Enables integration with 3rd party enterprise and building management systems, such as TAC by Schneider, for data gathering, customization and integration of PUE calculations.
Energy Cost for Data Centers

Energy usage report
Enables accurate cost analysis of energy use on a kW/h basis
Detailed at rack level

Calculations based on PUE
Includes an overhead factor or Power Usage Effectiveness (PUE) for calculating actual energy usage

Energy charge back
Shows the cost of energy consumption for specified equipment on room and tag level, for aiding charge back

Adapt to local costs
Provides the option of calculating energy usage based on local costs and currency

Measured or nameplate data
The report is based on measured data if available, otherwise adjusted nameplate values.

APC by Schneider Electric – Name – Date
Insight for Data Centers

Custom reporting tool
Advanced report designer built on BIRT that allows design any report within minutes using drag and drop functionalities

Supported by the community
Large set of plug-ins, templates and customizations available online

Export report
Customized reports built in StruxureWare Operations, Insight can be exported to pdf, HTML, Excel, and as CSV file

Large set of templates
Choose between a large selection of report templates or design your own customized report and save it for future use

Report building with external data points
Allows building reports that combine Operations data with any external data point obtainable via WS or Database
VIZOR for Data Centers

**Graphical Overview**
Graphical overview of power, cooling, space, and network on a weekly, monthly, or yearly basis.

**Barcode scan functionality**
Built-in barcode scanner for easy identification of assets

**Remaining Capacity**
Drill down view into any location or room and predictions of remaining capacity based on growth rate.

**Capacity Overview**
Full capacity utilization overview on power, cooling, space, and network at a glance.
Mobile for Data Centers

Mobile alarms
Provides alarms, descriptions and recommended actions

Mobile device moves
Eliminate manual data entry and reduce errors; adding, moving or retiring devices whilst on the move

Mobile work orders
View work orders and immediately update status as you complete tasks

Wireless mobile access
Work online or offline to access work orders and asset data whilst on the move in the data center

Offline mobile synchronization
Keep your physical data center synchronized with StruxureWare Operations

Mobile bar-code asset search
Quickly locate bar-coded assets via the search functionality
Dashboard for Data Centers

**Primary Function**
Summarize single site level energy key performance indicators

**High level overview**
Provides high-level overview for CEO-level customized according to needs

**Easy configuration**
Simple drag and drop functionalities and opens up for modifications to match the customer’s theme and design

**Open platform**
Based on an open platform that enables bringing in other data center metrics easily

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StruxureWare Operations Cluster

Cluster Enabled
Run in a cluster to ensure high availability, hereby enabling server redundancy

Load Balancing
Ensures to distribute the load between multiple servers

Optional Server Choice
Can now run on any vendor’s physical or virtual server

We still recommend StruxureWare Central as the device for monitoring services

Partial Loading
Swift loading of data needed from selected rooms only

World view
Drill down into any data center location using world view and get a detailed real-time capacity summary and alarm summary per location
Virtualization capabilities

- Virtual integrations with leading VM Managers
  - VMware vSphere™ Integration
  - Microsoft System Center Virtual Machine Manager

- Operations Management Pack
  - Automated response to physical infrastructure events
    - Moving virtual machines from impacted host servers running on faulty infrastructure to constant healthy host servers for uninterrupted uptime and availability

- Solution requirements
  - Struxureware Operations and Capacity for Data Centers
  - StruxureWare Operations Management Pack for Microsoft System Center virtual Machine Manager or VMware vSphere™ Integration

Problem: The impact of critical power or cooling events are not effectively propagated to Virtual Machines (VMs)

Solution: The critical events are translated into server impact analysis & VMs at risk are automatically migrated to healthy hosts
# StruxureWare Operations Competitors

<table>
<thead>
<tr>
<th>Competitors</th>
<th>Strengths</th>
<th>Weaknesses</th>
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</table>
| **Aperture’s Trellis** | - Software-only Integrated Resource Manager  
- Highly customisable workflow  
- Scalability  
- Brand awareness & Access to Liebert/Avocent accounts  
- BMC Remedy integration  
- Network switch port availability | **Aperture’s Trellis** | - Is reported to be very expensive  
- Every installation is custom  
- Lack predictive simulation  
- No equipment placement advisor  
- Lack wireless mobile workflow |
| **nlyte’s software** | - Dashboards  
- CFD and RFID Partnerships  
- Auto-discovery of servers  
- Hierarchical  
- Large enterprise customer base | **nlyte’s software** | - Speed of deployment  
- Lack mobile workflow application  
- No equipment placement advisor  
- No IT impact |
| **iTRACS’ Covered Physical Infrastructure Management** | - Cable management (initial product) & data port utilisation  
- 3D graphical visualisation of data center  
- Workflow management  
- Data center & server management incl PUE/DCiE  
- Web access from cell phone or notepad | **iTRACS’ CPIM** | - No subsystem analysis  
- No energy cost based on measured data  
- Speed of deployment  
- No cooling capacity/CFD simulations |
| **Rackwise’s Data center Manager** | - New SaaS offer (1-100 racks)  
- Rack and equipment visualisation  
- PUE/DCiE & breakdown of top resource consumers  
- Operational & financial what if impact analysis  
- Charge back reporting  
- Integration to CMDB & asset mgmt systems | **Rackwise’s Data center Manager** | - Limited workflow capabilities  
- Questions on scalability  
- No equipment placement advisor  
- No mobile workflow tool |
Data Center Integrated System

- Value proposition
  - One view from the rack to row to room to building
  - Optimized datacenter availability from 99.9% to 99.999%
  - Reduced total datacenter lifecycle cost up to 13% over 10 years
  - Enable connectivity to into VMware vSphere™
A complete system approach

### Domain: Power
- Power Quality
- Energy savings
- IEMCC
- Local MV control
- Local LV control
- Renewables energy conversion

### Supervision
- Power & Energy monitoring
- Power SCADA

### Enterprise
- Energy & ECO2 portal
- EEM

### Domain: Process & Machines
- Continuous process
- Discrete process
- General machine control
- Packaging
- Material Handling
- Hoisting
- Pump & fan control

### Supervision
- Process Control SCADA
- MES

### Domain: White Space
- PDUs (rack, traditional)
- UPS
- Cooling (in row, assembled)
- Surveillance
- Environmental monitoring

### Supervision
- White space monitoring
- Inventory mgt & workflow
- Capacity simulation & modelling

### Domain: Building Control
- Lighting
- Heating
- Ventilation
- Air conditioning
- Zone control
- Lifts & escalators

### Supervision
- Building Control

### Domain: Security
- Access control
- Video surveillance
- Emergency lighting
- Alarms

### Supervision
- Video surveillance
- Access control
Tools

- [http://salestools.apc.com](http://salestools.apc.com)
  - Training
    - DCIM Software Overview
    - DCIM Software How to Sell
    - StruxureWare Operation Suite Product Overview
  - Presentations
    - StruxureWare for Data Centers - Customer Facing
    - StruxureWare for Data Centers - Family Presentation
  - Service
    - StruxureWare for Data Centers Software Configuration Suite Statements of Work
    - StruxureWare for Data Centers Software Configuration Suite - Quick Sales Reference Sheet
- White Papers
  - #107: Data Center Infrastructure Management Software Improves Planning and Cuts Operational Costs
  - #150: Power and Cooling Capacity Management for Data Centers
  - #66: Estimating a Data Center’s Electrical Carbon Footprint

- [http://www.youtube.com/watch?v=IVzxxRwTdD0](http://www.youtube.com/watch?v=IVzxxRwTdD0)
- [apc.com/software](http://apc.com/software)
- [dcimsupport.apc.com](http://dcimsupport.apc.com)
- [blog.schneider-electric.com/datacenter](http://blog.schneider-electric.com/datacenter)
Thank you

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