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Our world is undergoing changes that force us to think in new ways: demographic change, urbanization, global warming and resource shortages. Maximum efficiency has top priority – and not only where energy is concerned. In addition, we need to increase comfort for the well-being of users. Also, our need for safety and security is constantly growing. For our customers, success is defined by how well they manage these challenges. Siemens has the answers.

**“We are the trusted technology partner for energy-efficient, safe and secure buildings and infrastructure.”**



**SIEMENS**

*Ingenuity for life*



Optimized efficiencies and smarter  
decisions for data centers

Datacenter Clarity LC™ helps IT and facility teams improve  
operating efficiency and asset utilization

Solutions for Data Centers

[siemens.com/dcim](https://www.siemens.com/dcim)



# Optimized efficiencies, smarter decisions

Bridging the gap between IT and facility management is an essential component to business success in a data center. With advanced monitoring and management solutions, you can ensure demand control and provide transparency for mission-critical facilities.

The data center infrastructure management (DCIM) solution from Siemens, Datacenter Clarity LC™\*, provides the appropriate tools and allows you to accurately and efficiently manage your infrastructure based on informed decisions.

# Challenges for today's data centers

Data centers face many challenges, ranging from huge data growth and the development of modern IT services, such as cloud computing, to requirements for safe and resilient data centers.

In addition, there is a growing need for better energy efficiency. Data centers use up to 40 times more energy than the companies for which they provide services. With advancing technologies, densities within data centers have increased, resulting in increased demand for efficient cooling. The amount of energy needed, as well as the associated costs, are increasing as well.

A data center infrastructure management system (DCIM) provides a single, comprehensive view into both IT and facility management—two areas previously managed independently. Implementing a DCIM solution allows data center owners to efficiently leverage existing synergies.

Datacenter Clarity LC™ is a software solution package designed specifically with data centers in mind. It includes tools for planning and simulation, asset management, power monitoring and more. These tools allow for planning, monitoring, measuring, managing and controlling the use and energy consumption of IT-related equipment and facility infrastructure components.

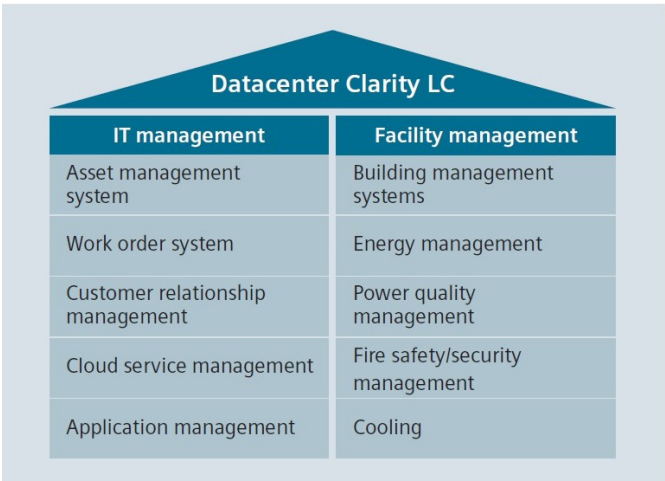
The software runs independently from other management software and communicates with devices throughout the data center. Vendor-neutral integration is provided via open protocol interfaces. Features and metrics may be customized to suit the needs of data center owners and operators.

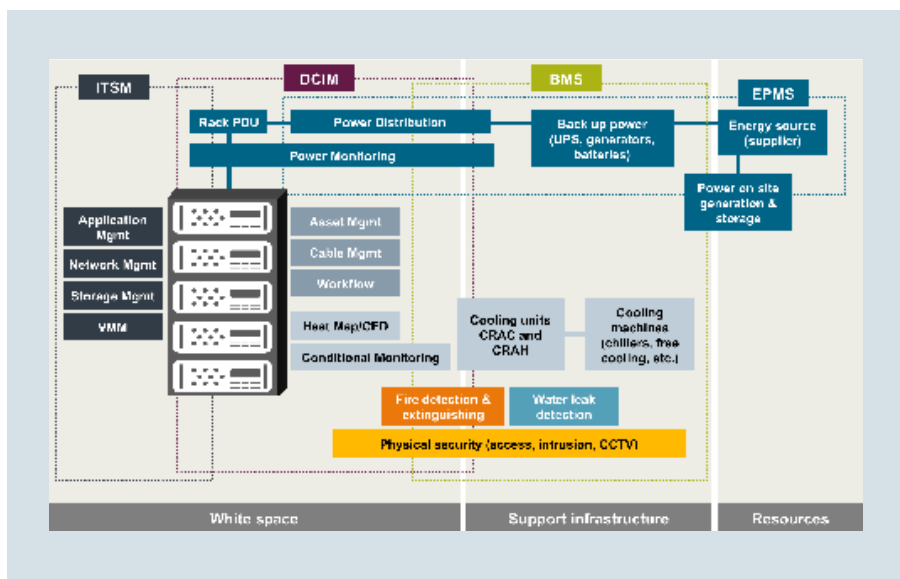
**Highlights**

- Bridges the gap between IT and facility management
- Creates transparency to monitor, measure and manage, allowing for smarter decisions
- Manages complex data center environments effectively and efficiently

Datacenter Clarity LC™ simplifies the complexity of asset management and provides desired performance monitoring.

- Provides operational cost information to allow decision-makers to quickly assess impact on bottom line
- Supports green initiatives with energy efficiency dashboards
- Allows for viewing of assets availability metrics to assist in predicting outages
- Enables data center managers to meet business growth initiatives with the ability to deploy IT assets in less time





# Bringing clarity to your data center

"DCIM is evolving rapidly, and newer and forward-looking systems have much greater embedded intelligence, integrate with building management and IT systems and business processes, and can provide sophisticated management planning and reporting tools. In its most advanced deployments, DCIM is used as a controlling suite of systems, akin to an operating system, that is the foundation for optimization and automation."

Source: 451 Research (2014):  
Next-Generation Datacenter  
Management

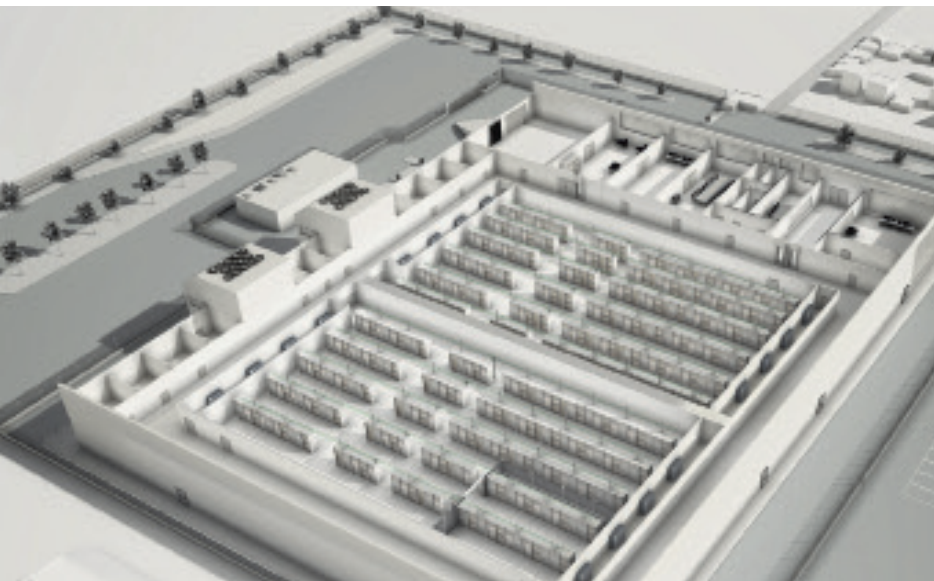
**Efficiency tools for decision-makers**  
Datacenter Clarity LC™ leverages state-of-the-art engineering software tools and puts them in the hands of decision-makers so they can optimize equipment placement and energy consumption. In doing so, the availability and longevity of the infrastructure can be increased.

**Visualize your performance**  
The Datacenter Clarity LC™ reporting solution leverages managed assets to provide a complete performance management tool. Reports are presented by displaying virtual 3-D views of your data center infrastructure and overlaying these with real-time operational data.

With the ability to intelligently link IT and facility assets with business- and performance-related metadata, you have all the information you need to make smarter, more informed decisions about your data center operation.

**Support through the entire lifecycle**  
The asset management solution lets you view your IT-related equipment and managed data in a 3-D representation of your facility. A single source of equipment, asset and process information will help you make smarter decisions and better plan your workflows.

With this asset management system, you can create long-term workflows that support data center management frameworks, as well as changes in infrastructure, such as migration, consolidation, expansions and new facilities.



#### DCIM sector composition

- 55% Monitoring (power, environmental)
- 34% Asset, configuration management
- 10% Cooling optimization, environmental management
- 1% Operational CFD analysis

Source: 451 Research:

Data center management software: DCIM and DCSO

#### Real-time, minimal risk

Datacenter Clarity LC™ offers a complete real-time picture of asset attributes in 3-D, as well as powerful tools to determine the most efficient data center configuration possible during capacity planning.

With its computational fluid dynamics (CFD) analysis technology, the solution uses managed assets to provide accurate temperature and airflow predictions. This lets you identify inefficient devices and hot spots prior to implementation and upgrades.

Simulation can be used to modify your data center facility infrastructure in a no-risk virtual environment to perform “what if” scenarios before you commit to actual changes.

#### Accommodate changes easily

With its modular design, planning and operation simulation capabilities that are based on real-time data, Datacenter Clarity LC™ easily accommodates rapid changes of today's data centers, while also protecting your long-term investments.

#### Established technology, future-proof architecture

Datacenter Clarity LC™ is built on the proven foundations of the product lifecycle management (PLM) software from Siemens, which has over 7 million licensed users. Its open API architecture facilitates interoperability and, as a vendor-neutral solution, supports more than 800 communications protocols from both IT and facility perspectives.

#### Highlights

Real-time picture of asset attributes in 3-D

CFD analysis for airflow predictions

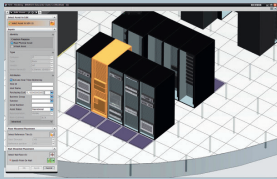
Protection of long-term investments with simulations based on real-time data

Future-proof, open architecture

# Datacenter Clarity LC

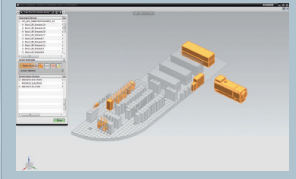
## Key features V2.4

### Asset and lifecycle management



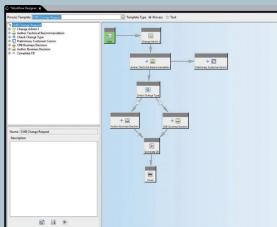
- Manages equipment change process
- Offers inventory management and report
- Updates library of predefined IT and facilities equipment regularly
- Links and manages IT and building assets
- Includes end-to-end power chain and cooling chain
- Runs "what-if" scenarios to allow for infrastructure optimization
- Searches for assets
- Provides information for users to determine optimal location for physical infrastructure and rack-based IT equipment
- Provides dynamic capacity planning (DCP) simulation to validate actual facility loads with infrastructure sizing to determine rate of growth

### Power management



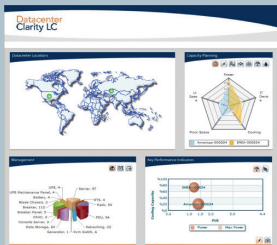
- Tracks and
- Identifies
- Manages

### Workflow and process management



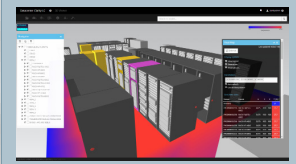
- Tracks and troubleshoots data center issues
- Analyzes the impact of future moves, additions and changes
- Creates customized workflows
- Manages project schedules, planning and resources
- Includes maintenance management
- Change request

### Key performance indicator dashboard

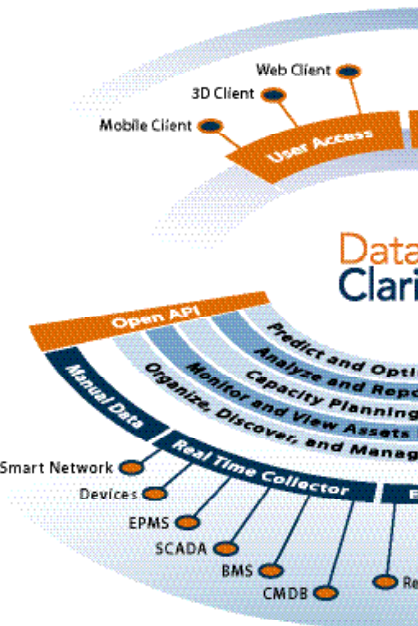


- Provides quick, simplified reporting, including:
- Company CxO level dashboards
  - Drill-down views at specific locations
  - Metrics and KPIs
  - Power Usage Effectiveness™ (PUE)
  - Water Usage Effectiveness™ (WUE)
  - Carbon Usage Effectiveness™ (CUE)
  - Rack Cooling Index™ (RCI)
  - Data Center Infrastructure Efficiency™ (DCIE)
  - Dashboard builder

### Web client

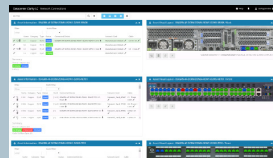


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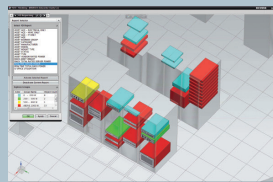
and manages power connections  
 upstream and downstream connectivity  
 capacity and predicts shortages

### Network management



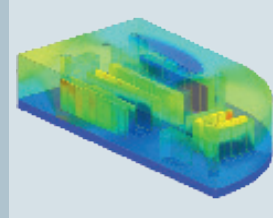
- Tracks and manages network connections
- Identifies upstream and downstream connectivity
- Manages VLANs
- Locates available copper and fiber ports quickly
- Manages capacity and predicts shortages

### High-definition asset visualization



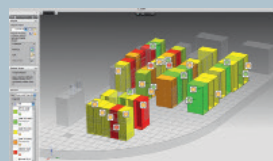
- Generates key views, including:
- Floor layout
  - Rack elevations
  - Operational dashboards in high-definition 4-D
  - Intelligent tags

### Computational fluid dynamics (CFD)



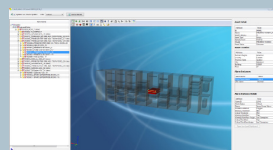
- Resolves all airflow and heat transfer physics virtually
- Determines the most energy-efficient configuration before implementation and upgrades
- Predicts temperature and airflow
- Identifies inefficient devices and hot spots

### Open interface and protocol support

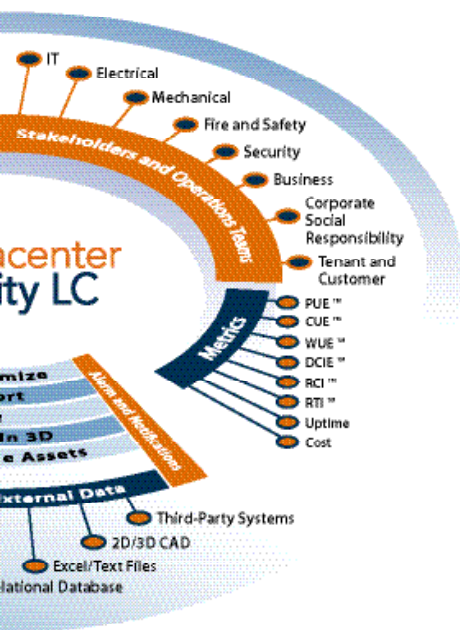


- Supports more than 800 communication protocols
- Includes advanced IT monitoring interfaces
- Provides an open API for enterprise software integration and customization
- Offers built-in mobile application

### Real-time monitoring, alarms and notifications



- Configures alarms on any monitored point of any asset
- Receives e-mails and SMS notifications
- Triggers workflows and task assignments automatically
- Keeps logs of event history
- Visualizes alarm events in 3-D or tabular format
- Monitors and collects low-level infrastructure data in real time to enable intelligent analysis by individuals with domain expertise
- Monitors physical security



ed access to all Datacenter Clarity LC™ logs  
 based cross-device and cross-browser com-  
 web client  
 interface for 2-D and 3-D navigation  
 eprint client installation  
 d usage information directly within the 3-D  
 e temperature monitoring and heat map  
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 connections and cable management  
 ment of asset and equipment database  
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 ment of Datacenter Clarity LC™ configuration

# Datacenter Clarity LC™ meets your challenges

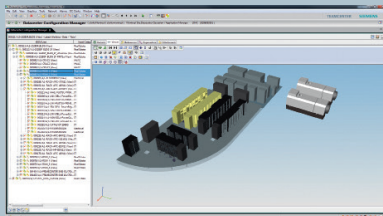
Datacenter Clarity LC™ supports your day-to-day data center challenges by providing a wide spectrum of capabilities

## HD 4-D reporting



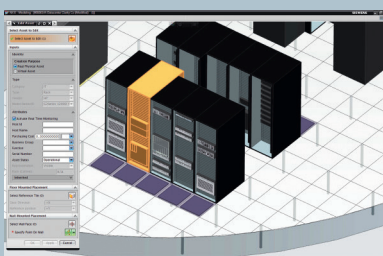
Datacenter Clarity LC™ offers a rich 4-D reporting toolkit, with out-of-the-box reports that can be utilized for planning and operational purposes and are a key to operating a data center at its maximum efficiency. This toolkit includes information about the temperature, status, category, age, date information, numbering information, real-time information, or even business or client information, which can be overlaid on the 3-D model.

## Locating an asset



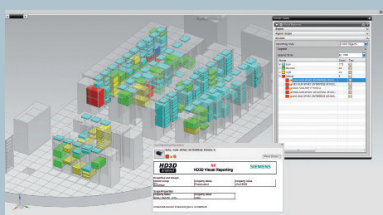
You can search for assets directly from the 3-D models. The assets can be searched by ID, name, category and type. It is possible to filter by status or serial number, or directly by entering the host ID. The searched assets can be seen highlighted in the model, and the user can navigate to them very quickly.

## Asset creation



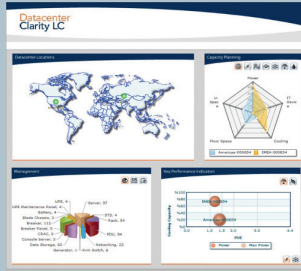
To create a new asset, you can first isolate the group of racks where the least amount of power is consumed. Afterwards, the asset can be created directly from the interface and you are able to choose properties to customize the characteristics of the new asset. You can see the asset immediately being added inside Datacenter Clarity LC™.

## Real-time monitoring



You can receive a wide range of information in real time. Datacenter Clarity LC™ allows you to view real-time alarm visualization and real-time power visualization, as well as real-time server CPU temperature (WMI and/or SNMP and/or IPMI interface calls would allow both power and CPU temperature to be obtained in real time, as well as other IT-relevant metrics).

## Key performance indicator (KPI) dashboard



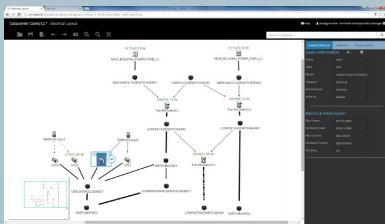
The high-level dashboard delivers aggregated, complete information. You are able to scale from one single data center to dozens of them being monitored from one central location if desired. Beside the information about power capacity, U space, floor space and cooling, you can also view the PUE and other KPIs, such as DCIE, CUE, WUE and real time, up-to-the-minute CAPEX and OPEX costs.

## Real-time device level dashboard



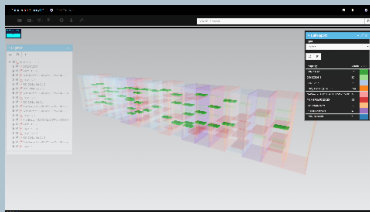
Datacenter Clarity LC™ allows for each asset to have its own real-time monitoring dashboard so you can access real-time information at any time. You can look at the minimum and maximum values and average and trended data over any time period you wish. This information is also available on a mobility app and is compatible with any operating system. From a touch screen or clicks on a Web access, it is very intuitive and you can get all of the real-time information that you desire.

## Electrical connections



With the electrical connection viewer, you are able to identify which servers are connected to each uninterruptible power supply (UPS). By selecting the UPS that will be affected, it is possible to see all the PDUs (power distribution units) that are powered by this specific UPS and to identify the servers associated with those PDUs.

## Advanced real-time monitoring



Datacenter Clarity LC™ allows managers to increase the efficiency of their data centers through advanced real-time monitoring:

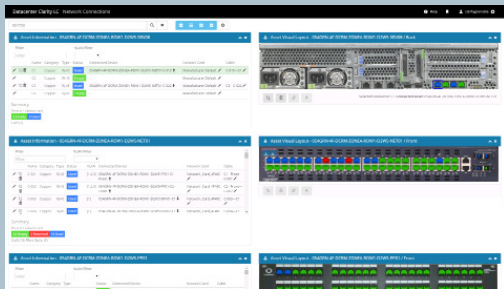
- Maximize space and power capacity to increase revenue
- Gain income through accurate consumption monitoring allowing detailed customer charge back
- Reduce cost through energy and space savings without impacting service quality
- Segment asset visibility by user role and set permissions for detailed and specific customer reports

Generate new business by offering colocation customers added value:

- Give customers access to real-time and Web-based power, bandwidth and temperature information
- Full billing transparency
- Maximum flexibility: support for more than 800 communication protocols

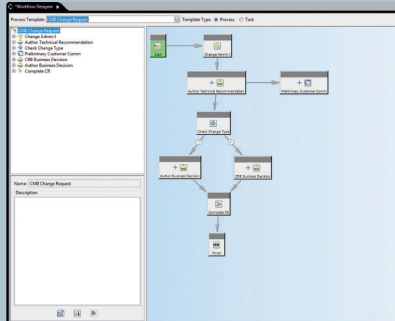
In addition, Datacenter Clarity LC's competitive user-based pricing (unlimited number of assets and sites) is the most cost-efficient model for colocation centers where multiple resources are monitored, typically, by a few users.

## Network management



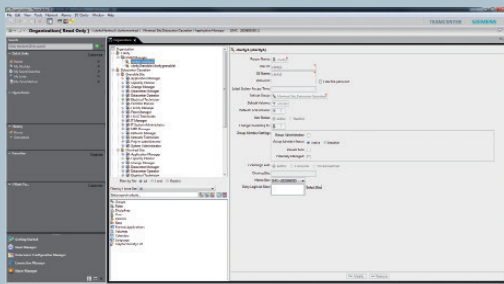
Out of the 3-D model, you can view the entire port table and connection table of an asset directly. This makes it possible to find empty connection ports and make automatic connections between assets. Furthermore, you are able to view all the connections of a row, isolate a certain VLAN, or a certain chain of connected assets, and investigate the port table for the specific assets. Furthermore, you can see the number of cables that are available, as well as which are used, connected, or not connected for the entire network within the cable folder.

## Workflow management



You are able to create customized workflows within Datacenter Clarity LC™. With this, you will always have an overview of the project schedules, the planning and the involved resources. The workflow management also includes maintenance management, where assigned workflows are released when maintenance is necessary.

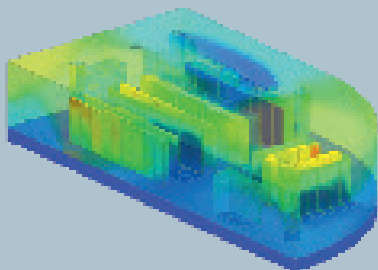
## Security level configuration



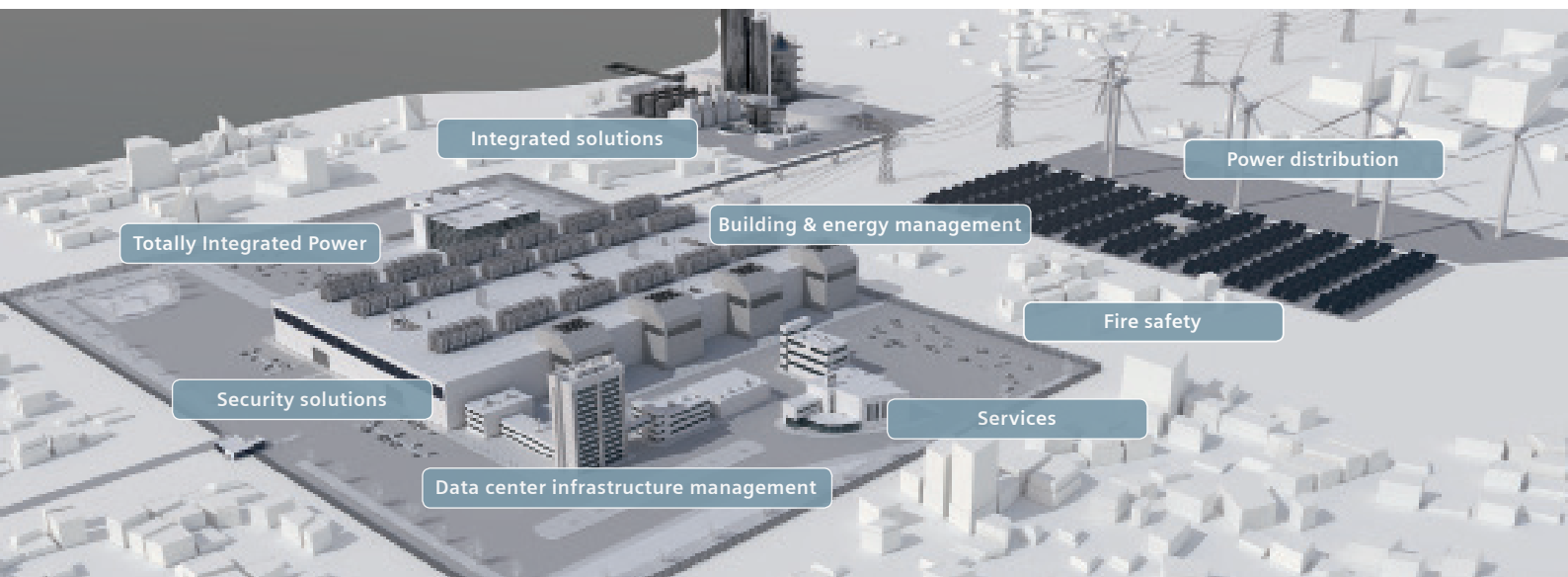
With DCIM graphical user interface (GUI), you can configure different security access levels. The different security access privileges can be set up through:

- Site locations
- Site groups
- Specific users
- Projects
- Roles
- All of the above and more  
(down to specific assets if needed)

## Computational fluid dynamics (CFD)



With computational fluid dynamics (CFD) calculations, you are able to virtually observe heat and airflow throughout your data center to detect hot spots and identify any loss of cool air. This information will allow you to ultimately optimize your data center to save energy and costs.



# Maximum uptime with integrated solutions

## Global expertise for your business

Siemens provides comprehensive solutions for data centers, supported by more than 7,000 technicians worldwide. Whether for new construction or modernization, you benefit from our expertise from projects executed all over the world.

## Green data centers

As the world's largest provider of green technologies, Siemens is at the forefront of reducing the global carbon footprint. Our environmental portfolio helps reduce carbon emissions, as well as reduce your PUE.

## Physical security

By offering fully integrated security solutions, Siemens ensures the security of the data, the building and its assets. From the perimeter to the rack, we provide security solutions that reduce the risk of security breaches, thereby reducing reputational losses and safeguarding your business' bottom line.

## Cooling, BMS and HVAC

Our integrated building management and monitoring systems help maintain the computer room areas within precise

environmental conditions, with the optimal use of free cooling and alternative energy applications.

## Power

The medium- and low-voltage portfolio from Siemens has been specifically designed to meet the demanding requirements in data centers, providing data centers with tailored, reliable and consistent end-to-end power distribution solutions.

## Fire safety

Fire safety solutions from Siemens are tailored to the specific data center environment and fire risk profile. Our solutions reduce the risk of wide-spread fire, utilizing the highest detection speed and accuracy, matched with preventive maintenance, improving the response effectiveness.

## Data center infrastructure management

Bridging the gap between IT and facility management is an essential component to business success in a data center. Our advanced monitoring and management solutions ensure demand control and provide transparency for all mission-critical facilities.

## Highlights

- Energy-efficiency optimization with green portfolio offering
- Complete data center portfolio
- Project support for new build and modernization
- Ensuring maximum uptime and availability