Data Center Infrastructure Management

Experience the inner calm that comes with successful data center management
and full control of valuable IT resources.

"There was 5 exabytes of information created between the dawn of civilization through 2003, but that much information is now created every 2 days…"

Eric Schmidt, Executive Chairman – Google Inc.

The rapid increase in digitization is creating a profound paradigm shift in almost every area of our lives. The ways in which people now communicate have triggered an explosion of digital information. Whether it is social networks, mobile communications, cloud-based services, or the emerging "Internet of things," the ongoing transition to a fully networked information society is changing the needs, expectations, and behavior of consumers and businesses alike. This transition is also an opportunity to offer new types of IT services built around groundbreaking business models.

As the quantities of data continue to grow, operators of data centers and network infrastructures are faced with two conflicting challenges. On the one hand, they have to use their IT resources to respond quickly and flexibly to these changes. As a result, IT managers are increasingly concerned with reliable, efficient, and fast deployment of demand-based IT services. On the other hand, they need to ensure that the underlying IT infrastructure can deliver. The important goal here is to achieve efficient use of network, server, load, power, and cooling capacities to enable rapid growth and consistently reliable operation despite cost pressures. The solution lies in the meshing of IT and facility team processes to allow integrated management of the IT infrastructure and the services running on top of it.

In order to scale that infrastructure as requirements grow, managers have to make more efficient use of capacities and resources through optimized planning, process automation, and predictive analytics.

To achieve a clear overview of all resources despite the huge amounts of data involved in infrastructure analysis (for both actual and planned states), managers need system-based scenario and planning functionality.

In practice, the necessary information is often stored in separate systems, making it difficult to perform a proper assessment of data center resources. A lack of accurate information for operational and strategic decisions can have a dramatic impact on both risk management and data center security in the event of an emergency, since it is difficult to validate the underlying assumptions.

It is also difficult to plan energy efficiency and environmental performance while also considering dependencies and knock-on effects. The lack of insight into the relationships between important components on both the IT and facility sides makes it difficult to satisfy internal compliance requirements and country-specific audit regulations.

In summary, it is essential to have a transparent overview of the entire data center in order to ensure that internal processes, infrastructure resources, and facility management are continuously adapted to market demand. By enabling cross-departmental collaboration within a fully integrated system, in which all data center assets can be planned and managed in context, it is possible to achieve cost-efficient and sustainable growth through optimal use of resources and capacities.
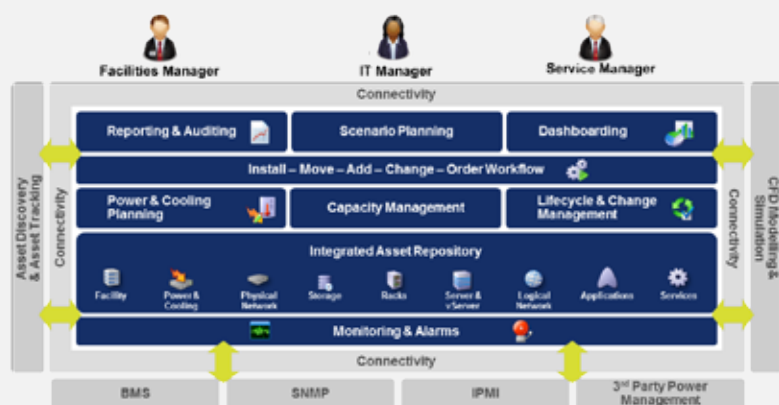
Overview of the functional areas of FNT's Data Center Infrastructure Management solution.

Overview of the FNT Solution

FNT's integrated approach to data center management offers a simple and sustainable solution to each of the challenges outlined above. The Data Center Infrastructure Management (DCIM) software provides transparent planning and administration of all assets in a single, integrated system.

The DCIM solution from FNT enables easy control of all key analysis, planning, and management tasks and supports you in the running of your data center, e.g.:

- Ensuring fault-free operation
- Detailed planning of future business needs and full implementation of IMAC processes
- Analysis and identification of unused capacities in the data center
- Analysis and planning of resource and energy efficiency in the data center
- Validation of planning and analysis based on monitoring data
- Data center consolidation projects
- Planning and establishment of new data centers, including setup planning
- Documenting use of financial resources in the data center and cost analysis
- Modifications and migration to new technologies and architectures
- Monitoring and analysis of energy consumption and performance for individual assets
- Documentation of data center efficiency in accordance with legislation and internal compliance policies
- Preparation for audits.

FNT Command is a standardized DCIM solution built around a unique, integrated data model. All information on individual assets, as well as their physical and logical connections, is managed in a single, centralized database. Using this holistic overview of every aspect of your data center, you can access all current and planning data at any time to support operational processes. The FNT data model provides all top-down and bottom-up dependencies for every device or business service across all layers, from the facility itself to physical, logical, and virtual assets, as well as all applications and services.

Data centers are fundamental to an organization's operational capability, regardless of whether they involve private, hybrid, or public cloud environments. The DCIM solution from FNT provides effective support here that enables significant improvements in all business areas.

FNT Command was intentionally designed as an open system with a wide range of predefined and standardized interfaces for third-party systems. These can be used to gather information from across the organization, store it in the central data model, and make it available to all departments.

This model is the basis for the FNT DCIM solution. As a full-fledged DCIM suite, it supports all key data center tasks across the facility, IT, and telecommunications segments.'

"With FNT Command, managers can carry out DCIM and network, cabling and IP management. Because FNT provides monitoring and asset management capabilities as part of FNT Command, we consider this to be a complete DCIM suite.".

Katie Broderick, Andy Lawrence – 451 Research

FNT Command Software

The DCIM solution from FNT is based on FNT Command, a modular, user-friendly, web-based solution with multi-client, multilingual, and multi-user capability. FNT Command has been developed and continuously updated over the past 20 years in close cooperation with FNT customers and in response to changing market trends.

FNT Command provides a modular software package for management of the facility, IT, and telecommunications infrastructures within enterprises, service providers, and public authorities. The modular approach enables users to start with the main challenges, focusing on current shortcomings and the most beneficial improvements, while also having the security of an expandable DCIM solution.

In fact, FNT Command is currently the only software product on the market that combines all the DCIM functionality required by data center facility and IT departments within a single, centralized data model. The package also includes key functionality for telecommunications and network management that is of value to every type of organization and useful for integration of multiple data centers.
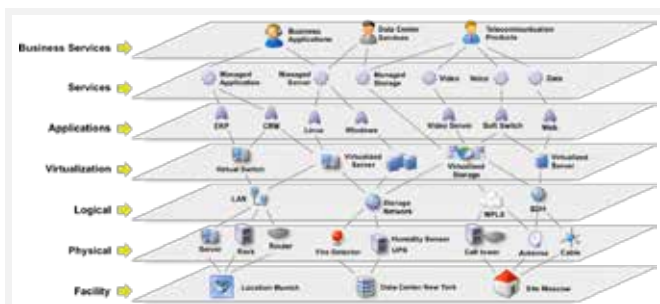

Fig.: Integrated data model used in FNT Command for comprehensive data center management

In addition, FNT Command features an extensive and highly detailed CI library with over 50,000 components, comprising a wide range of facility, IT, and telecommunications assets. All components are managed as intelligent objects within an integrated Asset Repository. As a result, they can all be logically combined for plausibility and integrity checking.

The DCIM solution from FNT includes the following functional areas:

Capacity Management
A key prerequisite for efficient data center operations is the ability to calculate loads and capacities in a reliable and meaningful way. FNT Command draws on validated data to provide accurate current and planning information at any time for use in capacity management.

Fig.: Analysis and visualization of available resources and capacities in the DCIM dashboard in FNT Command

With FNT Command, you can plan events for specific days. It is therefore possible to evaluate and visualize all capacities within the data center on any future date, which makes planning and decision-making easier for every aspect of your data center.
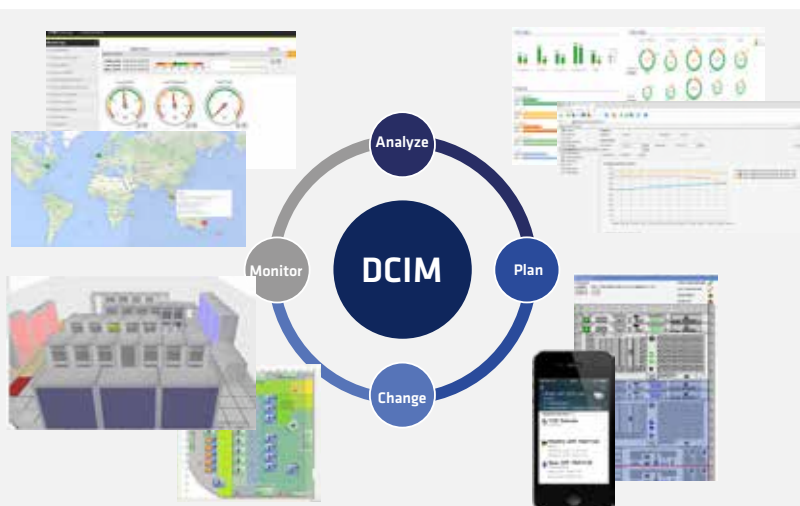
The end-to-end DCIM process with FNT Command

FNT Command presents all rooms and floor space to scale. This makes it easy to position switch cabinets and climate devices, for example. It is also possible to visualize and analyze floor space usage, floor design, and weight load using 2D and 3D footprints. Planning and managing multiple levels (e.g., regular floor, raised floor, and ceiling) is also supported.
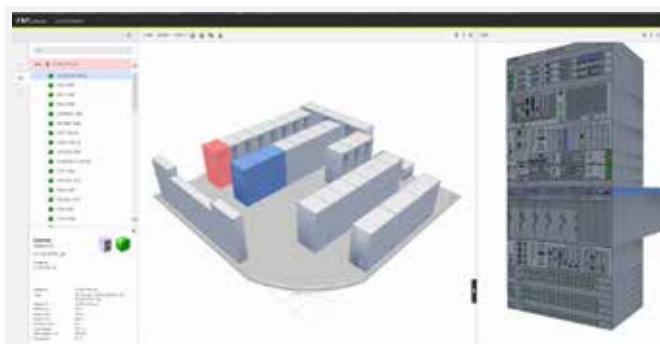

Fig.: Analysis and planning of data center using 3D footprint view

A sophisticated installation wizard helps you find suitable locations for installing devices or assemblies while automatically accounting for their specific requirements in terms of power consumption, heat output, height, weight, number of power ports, and redundancies. It is also possible to include additional search criteria, such as integration into logical networks, when looking for suitable locations.

Power Management & Planning

Effective planning and management of all energy requirements within the data center is essential in order to create resource-efficient, fail-safe IT infrastructures. All devices must be perfectly matched to the available power supply network. To ensure this, the manufacturer's power consumption data for each device is compared with the measured and empirical values for power consumers, with all planning and management taking place in FNT Command. The manufacturer's power consumption data for individual devices can be obtained from the component library. In addition, it is possible to store empirical and real values that are derived from measurement logs or imported live. This data is used for analysis and calculation of threshold values.

Power ports and their connections on the devices are displayed in graphical form. When installing end consumers, a check is made to ensure that there are enough free power ports in the zone or cabinet to meet power requirements. Power components, e.g., fuses, can be connected with servers or other active components using the available functions.

Starting at any end consumer, the integrated signal tracing function can then be used to determine the sub-distributor or low-voltage main distributor to which the respective component is connected. To increase reliability, non-redundant connections can be identified and adapted.

The ability to view, analyze, and plan the entire power supply network in a transparent manner helps create energy-efficient and reliable IT infrastructures.

Cooling Management & Simulation

As well as monitoring power consumption, FNT Command also evaluates thermal loads. Data centers, rooms, racks, and climate zones can be planned, monitored, and managed in terms of climatic load and performance. The data center's cooling circuits and climate devices, as well as the usage of these assets, are documented and monitored with regard to threshold values.

FNT Command thus provides immediate access to important information on climate conditions within the data center to ensure that thresholds are not exceeded.

Thanks to the integration of FNT Command with 6SigmaDC from Future Facilities, the market-leading software for Computational Fluid Dynamics (CFD), it is possible to create accurate simulations of both current conditions and planned modifications to the climate control system. This toolset can be used to optimize device installation and thus reduce cooling requirements.

Monitoring & Alarms

The FNT DCIM solution includes a powerful monitoring capability with integrated real-time performance and load analysis that supports day-to-day operation of the data center. Automatic verification and evaluation of measured values reveals the status of monitored components, enabling early identification of capacity bottlenecks. System states and alerts are presented in graphical form in a clear and easy-to-use dashboard. Automatic threshold checks with alert and notification functions and escalation routines enable users to manage large environments across multiple locations. In the event of a fault, the data required to trace the source can be opened and processed directly in FNT Command.
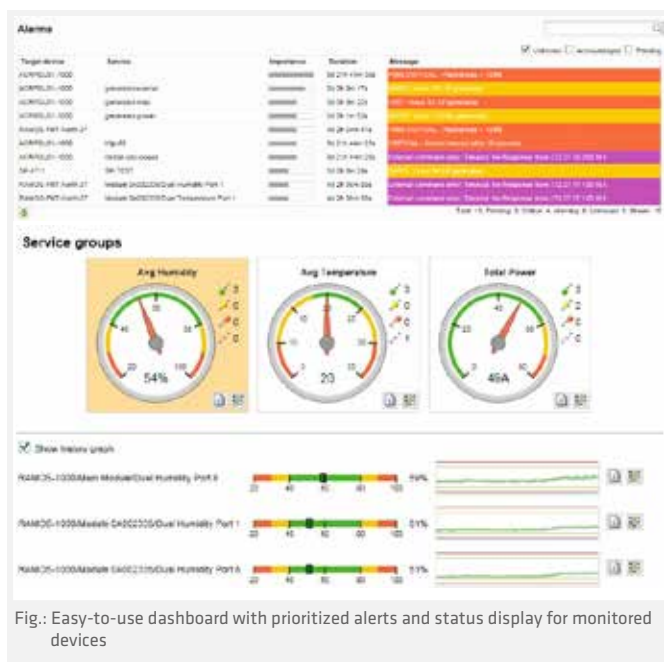

Fig.: Easy-to-use dashboard with prioritized alerts and status display for monitored devices

Monitoring data is stored in FNT Command for use in all planning processes, where it can be viewed in context and its significance evaluated in terms of availability, criticality, etc. As a result, the user has a complete overview of all relevant tasks.

Energy Efficiency Metrics

FNT Command can monitor and document power usage by individual end consumers, giving an accurate insight into energy consumption. It can then use the collected data to provide accurate evaluations and key metrics for the data center and

present this information in the FNT Command DCIM dashboard (e.g., PUE (Power Usage Effectiveness) or DCiE (Datacenter Infrastructure Efficiency).

Fig. FNT Command DCIM dashboard with PUE evaluation of multiple data centers (current status and comparison with historical values)

Cable Management

It is also possible to plan and document the connections between and within data centers as part of a comprehensive cable and patch management system. This enables effective management of structured cabling with patch and configuration cables. Integrated plausibility checks on the medium (copper, coax, fiber) and connectors help avoid planning errors. Other functions include bundled cabling for simultaneous insertion of multi-pair cables into multiple cabinets and the use of junction boxes. In addition, it is possible to plan and document cable routes, tray sections, junction boxes, splice boxes, and much more.

The integrated signal tracing function presents a clear overview of all connected devices and cables together with their respective key data. It is possible to view the connection path from any chosen starting point, in both the current view and planned view.

Integrated Asset Repository

This provides comprehensive management of all objects and assets that are recorded in the FNT data model. From facility and network/IT infrastructure to virtual assets and applications, the Asset Repository delivers powerful structuring, search, and processing functionality for all managed objects, including historization and lifecycle management.
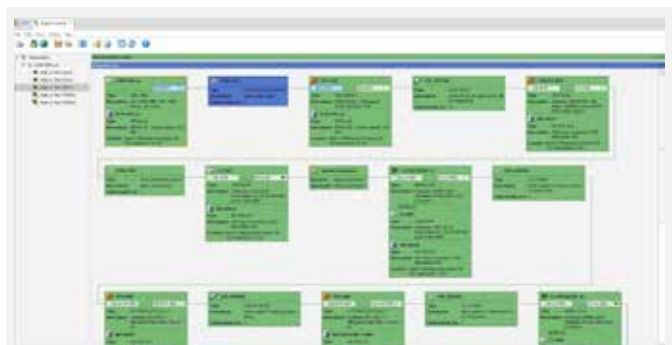

Fig.: Signal tracing in FNT Command enables detailed evaluation of all active and passive components in the data center

Locations can be managed across multiple, hierarchical layers, e.g., city, street, building, building connection, and room. It is also possible to create detailed room books for each individual zone.

Planning

FNT Command contains all the information required to support strategic decisions based on current and planning data. As a central DCIM suite, it delivers all the relevant data and provides valuable assistance for the following decision-making processes:

- Scenario analysis for data center consolidation projects
- Planning and establishment of new data centers
- Analysis of data center resource and energy efficiency
- Transition to new technologies and architectures

Lifecycle & Change Management

The comprehensive planning functionality provided by the DCIM solution enables targeted management of changes, which is indispensable in a controlled change process. Planning tasks can be created for specific days and assigned to the relevant persons for implementation. The special graphical representation in FNT Command immediately indicates to the user whether a specified asset is an existing object or a planned asset. This also prevents the use of installation slots that are already set aside for planned assets. The planning function supports setup, modification, and expansion tasks on racks, servers, devices, and network elements, as well as all other data center assets. All changes to CIs in the Asset Repository are documented in a comprehensive history and can be accessed at any time.

IMAC Processes & Workflows

As an integrated software solution, FNT Command offers all the major functions for planning future installations and changes. Optimal integration of all infrastructure workflows and change processes with the assets and components documented in FNT Command guarantees that the documented information corresponds with actual states. The Install, Move, Add, and Change (IMAC) workflow in FNT Command ensures that all planned changes are actually carried out and properly completed. It initiates the daily change processes in the data center and provides full control from planning to implementation, while also meeting important compliance requirements. Change processes can be initiated at any time and fully reconstructed during audits. This workflow support allows FNT Command to serve as the central management system for your data center.

Reporting

With the reporting wizard, users can define and publish customized reports based on all available documented data. Reports can be automatically created and distributed by e-mail at specific times, making it easy to share selected information with a wide range of recipients both inside and outside FNT Command.

Billing

When it comes to internal and external billing, more and more IT managers want to allocate infrastructure costs to individual cost centers based on actual usage of the infrastructure. FNT Command is designed for every possible scenario and can adapt to any business model – be it a company with a single data center, multiple data centers with IT rooms, or a colocation service provider.

Dashboards

With user-configurable dashboards, it is possible to present all relevant information in a selective and aggregated form for the various roles within the data center, e.g., senior management staff or data center operators. Based on the comprehensive data model in FNT Command, the dashboard function enables users to view a wide range of information in their own personalized set of predefined widgets and reports.
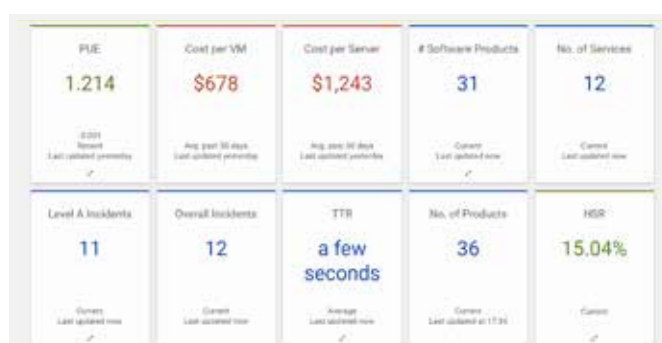

Fig.: Example of a customer-specific business value dashboard using data from FNT Command

Connectivity

FNT Command features an open architecture that offers extensive scope for integration with third-party solutions, e.g., workflow/provisioning systems, ERP solutions, etc. There are numerous predefined interfaces ready to use with Microsoft SCCM, VMware vCenter, Infosim StableNet, and other systems. It is also possible to use auto-discovery interfaces to identify active components in the network and include them in the integrated Asset Repository. By integrating FNT Command with asset tracking products, users can automate workflow steps and create accurate documentation in a single, end-to-end system. There is also a comprehensive application programming interface (API) that enables fast implementation of web services for exchanging data with third-party systems.

FNT offers an advanced ETL tool designed specifically for FNT Command that allows easy and flexible cleansing, exchange, and comparison of large quantities of data. It can also be used to compare actual and target values and supports numerous application scenarios.

Benefits of deploying the FNT DCIM solution:

- Acceleration of daily business processes and greater operational reliability

- Comprehensive planning functionality and lifecycle management

- Reliable load and capacity displays with accurate prediction

- True-to-scale 2D and 3D display of rooms and floor space

- Integration of real-time power consumption and climate data

- Precision planning and monitoring of heat output and cooling capacity

- Simulation and validation of climate capacities using integrated CFD

- Efficient change management and easy process automation

- Powerful evaluation, reporting, and dashboarding functionality

- Expandability with management functions for servers, software, IP management, etc.

- 100% web-based, multi-client solution with powerful authorization concept

- Extensive connectivity with third-party systems and open interfaces

FNT GmbH

Röhlinger Straße 11 **//** 73479 Ellwangen **//** Germany **//** Phone +49 7961 9039-0 **//** Fax +49 7961 9039-439 **//** info@fntsoftware.com **//** **www.fntsoftware.com**