Data Center Infrastructure Management

Experience the inner calm that comes with successful data center management.
The rapid increase in digitization is creating a paradigm shift in almost every area of our lives. The information technology research and advisory company, Gartner, describes this change as the “Nexus of Forces.” This growing convergence of social networks, mobile devices, cloud technologies, and big data is changing the needs, expectations, and behavior of customers, which in turn creates new opportunities for business. The interaction of these four forces is revolutionizing society and the business world, transforming old business models, and demanding faster and more flexible answers from IT departments. The “Internet of Things” is also set to drive this trend.

Against this backdrop, IT managers are becoming increasingly interested in secure, efficient, fast, and flexible deployment of demand-based IT services. In order to facilitate the enormous growth in data and provide the services people need, data center operators have to be able to plan their IT and physical infrastructure accurately while having complete transparency across all data center assets.

The challenge for operators and network managers is to efficiently deploy all data center assets to handle these growing data loads. The solution lies in optimal planning, process automation, and predictive analysis and prognosis of network, server, load, power, and cooling capacities. This in turn requires detailed information on the current and planned states of all devices. It is also essential to have scenario capabilities and planning processes that can serve as a basis for accurate prognosis.

In addition to these operational requirements, data center managers face constant cost pressure and have to compensate for the rapid growth in data through continuous improvements in process efficiency. Energy efficiency and environmental sustainability are also a priority – not just in response to legislation, but also as corporate objectives.

Issues, such as risk reduction, the securing of data centers against emergency situations, and adherence to compliance legislation or country-specific audit regulations, require data center operators to have an accurate overview of how all key facility and IT components are linked.

Other concerns requiring constant attention from data center managers include the development of new facilities, the consolidation or replacement of existing data centers, and the emergence of new technologies or architectural changes.

In many data centers, there is still a lack of integration between the facility and IT teams. The result is a proliferation of special tools for the various applications and areas of responsibility. What is absent, however, is a transparent overview of the entire data center operation. The only way to achieve cost-efficient and intelligent growth within a data center is through optimum utilization of space, electrical power, and cooling. And this is only possible with the aid of an integrated data center infrastructure management (DCIM) solution, in which all data center assets can be planned and administered in the context of a general overview and with full transparency.
These challenges can be addressed simply and effectively by applying an integrated data center management strategy based on the Data Center Infrastructure Management (DCIM) solution from FNT.

Data centers are becoming strategic pillars for many organizations, regardless of whether they use private, hybrid, or public cloud environments. DCIM supports improvements in all business areas. 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 operations and handling of IMAC processes
- Analysis and detailed planning of space capacity within the data center
- Situational analysis and planning of energy, cooling, and floor space requirements
- Data center consolidation projects
- Planning and establishment of new data centers
- Documenting use of financial resources in the data center and cost analysis
- Analysis of resource and energy efficiency in the data center
- Modifications and migration to new technologies and architectures
- Monitoring and analysis of power consumption of various assets
- Documentation of energy efficiency in accordance with legislation
- Preparation for audits

FNT Command is a standardized DCIM solution built around a unique, integrated data model. All the necessary assets and information are managed in a 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 your operational processes. The FNT data model provides all top-down and bottom-up dependencies for every device or service across all layers, from the facility itself to physical, logical, and virtual assets, as well as all applications and services.

FNT Command was deliberately designed as an open system with numerous predefined and standardized interfaces for third-party systems that can be used to gather information for the central data model.

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

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

FNT’s DCIM solution covers 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.

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 views.

"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
footprints. Planning and managing multiple levels (e.g., regular floor, raised floor, and ceiling) is also supported. 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.

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.

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 that meet the power requirements. Power components, e.g., fuses, can be connected with servers or other active components using the available functions.

Starting at a server, the 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.

Live Power Measurements & Energy Efficiency Metrics
Monitoring of power consumption and documentation of this data in FNT Command provides an accurate overview of current usage of available power. Monitoring can be implemented using the integrated FNT Command DCM Integrator powered by Intel® module.
In addition, it is possible to monitor all SNMP-enabled devices directly and to connect other third-party systems (monitoring systems for power and/or climate, building management systems). The open architecture used in FNT Command enables importing of measurement data from multiple sources.

FNT Command uses the collected data to provide accurate evaluations and key metrics for the data center and to present this information in the FNT Command DCIM dashboard (e.g., PUE (Power Usage Effectiveness) or DCiE (Datacenter Infrastructure Efficiency)).

Cooling Management, Planning & 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 provides immediate access to important information on climate conditions within the data center while ensuring that threshold values 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 reduce cooling requirements.

Monitoring & Alarms
The open architecture and standard interfaces in FNT Command enable integration of device-specific monitoring solutions that supply live monitoring data, which can then be compared with the relevant specifications in the integrated FNT data model. This comparison enables intelligent, context-based evaluation of incoming alarms as well as reliable assessment of their significance in terms of availability, criticality, etc. As a result, you remain fully informed at all times and can focus on relevant issues. In addition to monitoring of devices, it is necessary to have a clear overview of states and alarms to ensure reliable operation of your data center. The respective data is presented in the FNT DCIM dashboard in conjunction with the current information.

Integrated Asset Repository
The integrated Asset Repository is the heart of FNT Command. It 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.

FNT customers use FNT Command to manage millions of different assets. It can be deployed to run locations with multiple, hierarchical layers, e.g., city, street, building, building connection, and room. You can also create parallel and logical structures to simplify management of all assets.

In addition to locations, rooms, racks, servers, and routers, the integrated Asset Repository can be used 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. This also enables functions, such as bundled cabling for simultaneous insertion of multi-pair cables into
multiple cabinets and the use of junction boxes. In addition, it provides the ability 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. Signal tracing can be performed from any connection point for any connection path, both in the current view and in planning view.

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

**Lifecycle & Change Management**

All objects managed in the integrated Asset Repository in FNT Command can be displayed in both the current view and in planning view. 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. A special graphic display 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. You can use the planning function to carry out set-up, modification, and expansion tasks on racks, servers, devices, and network elements, as well as all other data center assets.

The comprehensive planning functionality provides a range of important status information that is essential for an effective change management process. All changes to CIs in the Asset Repository are documented in a comprehensive history and can be accessed at any time.

**IMAC Processes & Order Workflow**

As an integrated software solution, FNT Command offers all the major functions for planning future installations and changes. However, even the best planning is futile if the proposed changes are not implemented and monitored using a suitable process. Only through optimal integration of all infrastructure workflows and change processes with the assets and components documented in FNT Command is it possible to guarantee that all 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.

The planning view enables flexible assembly of change orders from individual detail orders and associated process steps. These change orders can then be assigned to the relevant persons for implementation. This workflow support allows FNT Command to serve as the central management system for your data center.

**Reporting & Auditing**

The data required for internal or external billing of energy consumption can only be made available with sufficient detail and precision if the DCIM system has the capacity to manage any possible scenario for clients within a given instance. When collecting information, each client can be specified with its own unique requirements and level of detail (e.g., connection, PDU, storage, etc.). It is also important to have flexibility when defining clients as these can take a number of forms, e.g., a network group within a data center or a corporate customer.

From a company with a single data center to multiple data centers with IT rooms, from a mobile service provider or colocating service provider to an Internet service provider, multi-client capability is the key to flexible management. An advanced multi-client solution is also an essential prerequisite for implementing chargeback models. More and more IT managers want to share their infrastructure costs between multiple entities based on actual usage of the infrastructure. FNT Command is designed for every possible scenario and can therefore adapt to any business model.

**Scenario Planning**

FNT Command contains all the information required to support strategic decisions based on current and planned 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
Dashboards

With the DCIM solution, it is possible to present important selective and aggregated information in user-specific dashboards for the various roles within the data center, e.g., management personnel or data center operators. Ready-made widgets provide a clear and simple display of a wide range of relevant information based on the comprehensive data model in FNT Command. Thanks to the built-in interfaces, it is also possible to use dashboard applications from other vendors.

Connectivity

The open architecture of FNT Command offers comprehensive scope for integrating with solutions from other software vendors (e.g., monitoring systems, workflow/provisioning systems, ERP solutions, etc.). You can also integrate FNT Command with asset tracking products (e.g., RF Code Zone Manager) and auto-discovery systems (e.g., Infosim StableNet and Cisco Prime) in order to automate workflow steps and create more accurate documentation. For example, it is possible to use auto-discovery systems to identify active components in the network and include them in the integrated Asset Repository. You can also use standard protocols, such as IPMI and SNMP, to enable monitoring of power consumption or heat generation for a wide range of components.

FNT provides a specially optimized staging area for FNT Command that enables easy and flexible cleansing, exchange, and comparison of large quantities of data. It can also be used to compare actual and target values.