APPLYING DATA CENTER INFRASTRUCTURE MANAGEMENT IN COLOCATION DATA CENTERS

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Executive Summary

As companies look to reduce costs for building and maintaining data centers, colocation is an increasingly popular alternative. However, intense competition in the colocation market requires providers to differentiate their services while extending the life of their data centers.

Traditionally, colocation providers have relied on proprietary and isolated monitoring systems, spreadsheets and Visio diagrams to operate their infrastructure. These tools do not provide the depth of information and level of insight required to optimize use of the physical infrastructure, including space, power and cooling.

Data center infrastructure management (DCIM) enables colocation providers to optimize every aspect of the IT and facilities infrastructure from physical and virtual inventory to power and cooling systems. DCIM monitors the entire infrastructure and combines real-time, detailed data about every asset with sophisticated analytics, visualization tools and reporting to facilitate far more accurate power, capacity and cooling management.

With DCIM, colocation providers can transform their approach to asset management and capacity planning, completing tasks in just minutes that once took hours or days. Providers gain the level of insight they need to deliver more responsive and transparent service to clients while maximizing data center density without risk.

The Colocation Market

With the improved economic outlook, enterprises are once again looking for IT projects that will drive revenue and business value. However, tight budgets and pressure to contain costs mean that investing in capital equipment and increasing the size of company data centers is no longer the first choice. These factors have made colocation an increasingly popular alternative.

In response to the growing demand, colocation providers have quickly proliferated. For example, in the U.S., there are now more than 1,000 colocation data centers[1], creating a highly competitive market that makes it difficult for providers to distinguish themselves in a sea of competitors all offering Tier rating certifications, neutral carrier offerings, high security, power assurance and so forth.

This means that colocation providers need to compete on more than price alone. They need to find new ways to offer value-added services that address the growing expectations of their customer base while continuously optimizing their operations to reduce costs and extend the life of the data center.

Important Points

While price is a key driver when choosing a colocation provider, winning and maintaining clients require offering services that meet key customer expectations including the following:

> "It is clear that the most adaptable, economically sustainable and best-managed data centers will be those where managers have accurate and meaningful information about their data center's assets, resource use and status—ideally from the lowest level of infrastructure up into the middle or higher echelons of the IT stack."
>
> **Datacenter Infrastructure Management Software**: Monitoring, Managing and Optimizing the Datacenter Report
>
> **The 451 Group, 2011**

CUSTOMER EXPECTATIONS	COLOCATION PROVIDER REQUIREMENTS
Enable expected growth at reasonable cost	Optimize data center space, power, connectivity and cooling usage to effectively balance supply and demand
Support "green" initiatives	Understand energy use and costs to know exactly where efficiency losses are occurring and how to improve utilization
Guarantee bandwidth and uptime	Be able to administer power and connectivity in real time and understand the relationship of the power chain to a specific client's assets
Optimize IT staff productivity and efficiency	Provide client IT staff with real-time visibility into their assets and enable them to predict the impact of change on their operations

[1] *Best Practice: How to Select the Optimum Colocation Provider and Data Center to Meet Your Needs. Gartner 14 June 2011.*
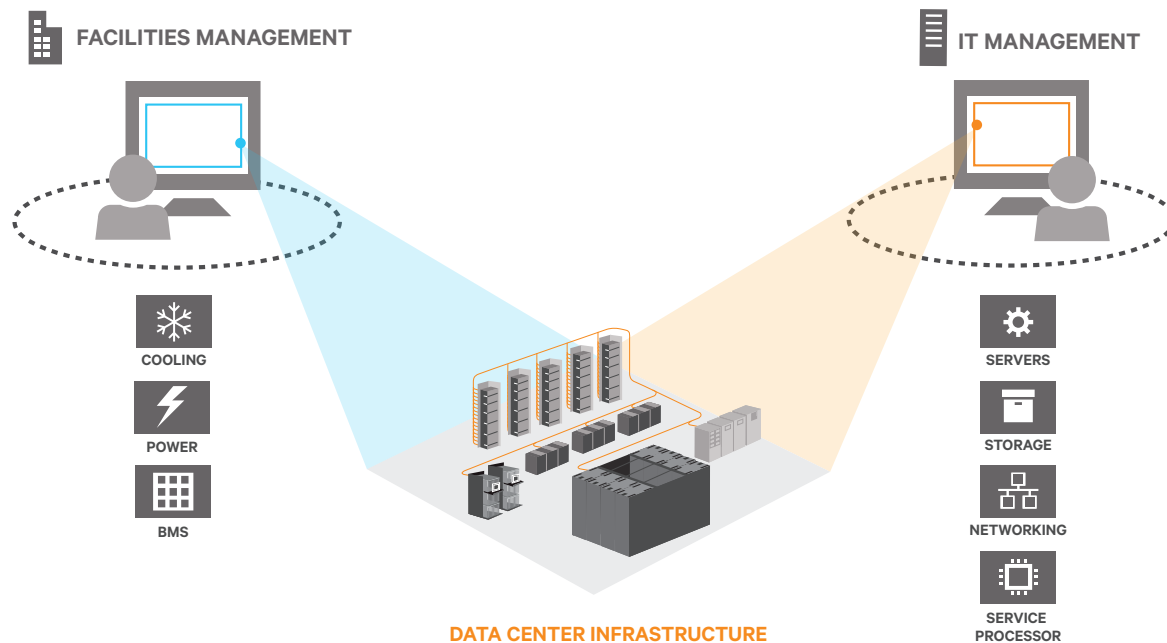
An Introduction to DCIM

While most colocation providers have implemented some IT process automation, in many cases this automation does not use current-state data and typically stops at the IT device level. Data center managers are forced to rely on proprietary and isolated monitoring systems, spreadsheets and Visio diagrams to operate their infrastructure with little ability to collaborate across IT and facilities. For colocation providers, this inability to gain insight into the total current infrastructure and manage the data center as a whole leads to inefficient power usage, wasted capacity, higher costs, more downtime and dissatisfied customers.

DCIM is designed to solve these problems with a centralized approach to asset management and capacity planning. By monitoring the entire infrastructure of the data center—both IT and physical assets—DCIM enables unprecedented visibility, helping colocation providers optimize capacity, maximize efficiency and maintain high availability.

Important Points

- A well-executed DCIM solution uses an intelligent infrastructure to monitor, collect and analyze data continuously and in real time, enabling immediate action to balance supply and demand.

- Because DCIM can manage all infrastructure assets, it facilitates a true cross-domain management strategy that is run by performance metrics in support of lean management processes.

- A DCIM solution tightly integrates IT and facilities operations by keeping track of everything in a data center. For example, DCIM tools can monitor servers, routers, storage, power distribution units and environmental monitors as well aggregate KVM, serial and service processor functionality to provide access and control over every device.

FACILITIES MANAGEMENT

COOLING

POWER

BMS

IT MANAGEMENT

SERVERS

STORAGE

NETWORKING

SERVICE PROCESSOR

DATA CENTER INFRASTRUCTURE

DCIM – Application across the Data Center Service Provider Spectrum

Whether your organization is a colocation provider, a managed hosting and application management provider, cloud service or all of the above, the need for complete and accurate visibility into infrastructure is the key to successfully managing costs, capacity and availability.

Because DCIM enables precise, real-time asset management and intelligent capacity planning, all types of service providers can benefit. DCIM makes it possible to extend the life of the data center and successfully address escalating energy costs and stranded capacity, tight budgets and floor space, limited staffing and the ongoing pressure for more uptime.

The Value of DCIM for Colocation Providers

DCIM can manage and monitor every aspect of the IT and facilities infrastructure from physical and virtual inventory to power and cooling systems. For colocation providers, DCIM not only addresses the critical requirements of power, capacity and cooling management, it can also help them distinguish their offerings with attractive value-added services.

Managing Power – Because DCIM can show real power values with actual power draw, colocation providers can easily identify stranded power and eliminate costly overbuilding. For example, DCIM can provide current and historical energy efficiency metrics in order to accurately calculate power usage effectiveness and data center infrastructure efficiency. Automated mapping shows the active power path, utilization and device dependencies in the power chain for insight into loading and the relationship of a client's equipment to the power grid.

Managing Capacity – A real-time, comprehensive inventory of floor and rack space provides meaningful views to both IT and facilities, making it easier to work collaboratively in order to maximize space and power usage, discover hidden capacity and reduce the time and costs for floor and zone management.

Managing Cooling – A complete profile of cooling systems, from air conditioning and air handling units to valves and dampers, delivers insight into the actual capacity and utilization of cooling subsystems, the dependencies between devices and an accurate, real-time status for each device.

Important Points

While DCIM can reduce costs, increase efficiency and improve the quality of service delivery, colocation providers can also leverage these capabilities to differentiate their business with value-added services that directly address growing client demands. For example:

- System-generated reports provide visibility into racks showing the details of those devices belonging to a specific client. This allows clients to know exactly what devices they own and where they are located in the data center.

- Remote asset management can be a major attraction for new clients as it provides a single source of truth for clients to track changes and align people to tasks.

- Specialized analytics such as "what-if" modeling allow clients to see how changes will impact their specific environment and proactively plan response.

Supporting Colocation Requirements

DCIM can deliver capabilities that address the fundamental needs of the colocation provider including:

- Real-time report views on available versus occupied space

- Real-time power consumption data to maximize floor space and release stranded power currently allocated to zones

- Impact report analysis by the customer names associated with a power chain device failure or planned downtime for maintenance

- Customized power availability reporting for new customers

- Cross-connect activity tracking and reporting

Use Cases - DCIM in the Colocation Data Center

Typically, colocation data centers are managed with a variety of disparate and disconnected monitoring tools as well as spreadsheets and Visio diagrams—all of which add up to intense manual effort and high costs in order to perform common tasks and resolve issues that arise daily.

With DCIM, colocation providers can complete tasks that once took hours—if not days—in just minutes. It also helps providers deliver more responsive and transparent service to clients. And, most importantly, DCIM can maximize data center density, doing away with stranded power and unused rack and cabinet space.

Use Case 1: Efficiently Managing Outages

The Problem: When unexpected outages, such as a UPS or PDU failure or planned maintenance that will cause outages to occur, it is often difficult to know quickly which customers are affected.

The Solution: Because DCIM can be customized to identify each piece of equipment by its owner and how that equipment is connected to the power chain, determining who is affected is as simple as printing a report of the customer equipment that is attached to a specific device. This enables colocation providers to provide advance notice regarding planned outages and to alert the right customers immediately when unexpected interruptions in service occur.

Use Case 2: Correctly Allocating Resources for New Assets

The Problem: When a client provides a list of assets to be deployed, it can be a time-consuming, manual process to calculate which cabinet has the sufficient power, networking and power redundancy, cooling and so forth. Available capacity can end up being wasted because a margin of error must be built in to accommodate lack of accurate, detailed information.

The Solution: DCIM combines comprehensive nameplate information about each asset, real-time data about the current state of each cabinet and sophisticated analytics to streamline the process of determining where assets should be installed. Using drag-and-drop visualization and "what-if" analysis, colocation providers can accurately model the space, power and cooling requirements for the specific assets in a matter of minutes and maximize cabinet density.

Vertiv™ and DCIM

Vertiv™ offers a powerful DCIM platform for removing the barriers between IT and facilities and optimizing every aspect of data center operations.

Leveraging Vertiv´s proven expertise in asset, power, cooling, infrastructure management and embedded firmware technologies, the platform provides a complete solution for monitoring and managing all assets in large, complex data centers.

For colocation providers, Vertiv´s approach to DCIM offers an unprecedented level of control and accurate decision making to deliver outstanding value to clients while optimizing availability, capacity and cost efficiency.

Use Case 3: Maximizing Data Center Capacity

The Problem: Traditional capacity planning tools lack the level of detail and intelligence needed to accurately calculate maximum floor utilization without risking overload of power and cooling systems. As a result, colocation providers often over-specify total data center infrastructure requirements, driving up costs with wasted space, power, networking redundancy and cooling equipment.

The Solution: With DCIM, providers can maximize data center space utilization, using the least amount of power, redundancy and cooling without risking overload. DCIM includes a library of manufacturers' assets that provides granular and accurate data. Using the visualization tools, assets are dragged from the library into a model of a rack with the available power, cooling and networking consumption immediately deducted. In addition, DCIM captures historical and current power usage directly from devices to identify consumption trends, while timelines show exactly when and how rack capacity will be impacted by changes over time. For colocation providers, these capabilities eliminate the need to over-provision.