nlyte Software

ENLIGHTEN YOUR DATA CENTER

WHY YOU NEED INTELLIGENT CAPACITY PLANNING FOR YOUR DATA CENTER

USING DATA CENTER INFRASTRUCTURE MANAGEMENT SOFTWARE TO HELP MAKE THE MOST EFFICIENT USE OF POWER, COOLING, AND SPACE

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Pouring money into your data center is probably one of the last things you want to do during an economic downturn. But the fact is, modern companies can't function without fast, reliable access to enterprise software and data.

Given that most companies get by with old data centers that weren't designed for today's high-density servers and are located in facilities that can't be expanded, you'll likely be called upon to approve large capital investments for your data center sooner rather than later.

Learn how you can accurately predict the right time to make this huge investment—so that you have an alternative to over-provisioning at the data center level—and avoid the risk of running out of capacity.

Data center managers know that their company must avoid the risks associated with running out of power, cooling, and space—because data center failures can quickly bring operations to a grinding halt. But typical costs of major data center changes can break the budget of today's cash-strapped companies. For example:

- A typical hardware refresh for a 200-rack data center can cost several million dollars
- Mergers and acquisitions may require that you expand your data center, which can double and even triple data center costs (depending on the size of the business being integrated)
- Data center consolidations may run into the tens of millions of dollars for a large (i.e., greater than 10,000 square feet) site

As an executive responsible for making decisions about how to best use limited budgets, how do you decide if and exactly when these investments are necessary? How can you determine if they will deliver the scalability, reliability, performance, cost savings, and other return on investment (ROI) that you need to justify the expense? What approach do you use to understand proposals in relation to actual business risk?

As explored in this paper, without the right analytics and visibility, you can't. And that's when data center costs and risks start to mount. But with the right analytics in place, you can control and drastically reduce these costs and risks. As explored throughout this paper, data center infrastructure management (DCIM) software can help you gain the visibility, control, and predictive insight needed to accurately plan and budget for major data center changes. For example, customers using data center infrastructure management software have:

- Reduced the cost, time and risk of migrations and consolidations by up to 50%
- Decreased the business risk and expense caused by downtime & catastrophic failure by up to 50%
- Deferred the capital expense for new data center build outs by 5 years or more
- Cut power expenses by 20% annually and reduced power usage effectiveness (PUE) to 2.0 or less
- Improved the operational excellence and optimized power, cooling and space

OVER-PROVISIONING AS A FORM OF RISK MANAGEMENT

In most cases, data center managers have only a high-level understanding of their data center environment. And because information is usually managed and tracked in spreadsheets, it's fraught with errors, gaps, and out-of-date information. For example, data center managers typically have little insight into their current server utilization rate, actual energy and cooling costs, how many orphaned servers are running, and where they are. It's also hard for them to proactively identify where hot spots exist and track application dependencies—critical information needed to avoid unplanned downtime due to data center changes.

Given these "blind spots," data center managers proposing new consolidations, relocations, and virtualization strategies do so based on limited information about their actual data center environment. Given the need for high reliability and performance, most data center managers are forced to take the "better safe than sorry" approach to data center planning and management. By over-provisioning data centers, they hedge their bets about what they don't know and could hurt your business. Companies that allow their data center to reach capacity usually experience frequent outages, project cancellations, reduced productivity, impaired customer service, and a loss of competitive agility.

But there's a high cost to over provisioning—and it's only increasing as power, space, and cooling costs go up. The data center raised floor, with costs ranging from $1,000 to $2,000 per square foot, is the most expensive piece of real estate for most organizations today. The cost of a five-Megawatt data center build-out (which typically includes tens of thousands of servers) can easily exceed $125 million.

Why would you want to direct such massive funding to investments based on, at best, an educated guess?

Over Provisioning: A Common Occurrence

Over provisioning of data centers happens more frequently than you may think. In our work with customers all over the world, nlyte consultants rarely find a business that's not over-provisioned. For example, a global software company that needed to meet increasing growth and capacity requirements funded new cabinets in Hong Kong and Australia. Operations in each geography intentionally over provisioned to ensure they met the objectives. Soon, the Chief Financial Officer (CFO) began receiving over 40 separate bills from different vendors—all for regional data center space. Even the Chief Information Officer (CIO) was unaware of why this was happening. In effect, both the CFO and IT were operating blind with regard to the cost of over provisioning. They used the nlyte DCIM Suite to find and document all assets globally, determine the size of the environment, make virtualization decisions, plan and execute the migration, and optimize the efficiency of daily data center operations.

DATA CENTER INFRASTRUCTURE MANAGEMENT: THE KEY TO OPTIMIZING PLANNING, INVESTMENT, AND MANAGEMENT

The good news is that new management and analytical tools are available that enable you to fully understand your entire data center landscape as a single "entity"—just as you do your global IT network—and make informed decisions that optimize planning, investment, and day-to-day management.

Data center infrastructure management (DCIM) represents an entirely new and innovative way of managing data centers and making decisions regarding planning and investments. DCIM is about having the visibility, insight, and processes to drive performance throughout data centers and make plans and investments that consistently deliver results. Leading DCIM software enables you to collect and understand massive amounts of data so you can make informed decisions that make your data center resources as efficient, effective, and functional as possible and help you plan ahead for future needs.

With the right DCIM solution:

- Executives responsible for overall IT can collect and understand massive amounts of data so they can view and manage all of their data centers as a single entity. They can also use sophisticated what-if scenarios to understand the implications of different plans and decisions before changes are made.
- Data center managers and their staff can make informed decisions on a day-to-day basis that extend data center life by increasing operational efficiency. For example, they can stretch space, power, and cooling resources; server life; and other resources in a safe, controlled manner, as well as reduce redundancy and proactively forecast and plan for the deployment of assets.

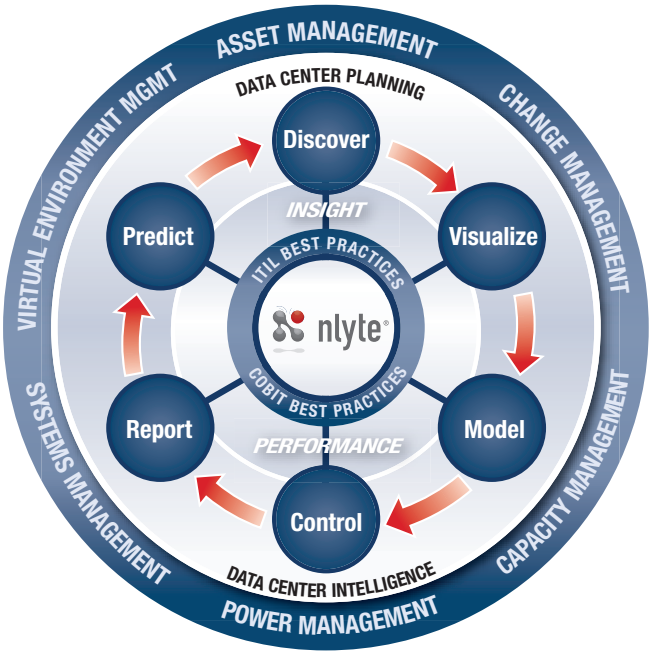
Ideally, DCIM solutions cover both physical and virtual environments and encompass all aspects of data center management. nlyte Software offers the most complete, performance-based solution for DCIM, combining next-generation software, proven best practices, and unsurpassed expertise in data center management. For example, as shown in Figure 1, the nlyte DCIM Suite supports the data center best practice process cycle, which includes the following steps:

- Discovery and mapping of all data center assets, relationships, and dependencies
- Visualization of all assets and their relationships
- Modeling and planning for migrations, consolidations, and changes, as well as capacity and power usage effectiveness (PUE)
- Controlling and management of data center assets and personnel and monitoring of key indicators
- Reporting and dashboarding across all data center metrics
- Making predictions regarding future data center needs and capacity optimization

When all of the processes described above are integrated, you gain an accurate, holistic, and real-time overview of your data center entity. This enables executives to make informed decisions regarding planning, investing, and provisioning at the broader data center "macro" level. At the same time, it empowers data center managers to proactively manage power, space, and cooling in ways that extend the life of data centers and increase operational efficiency to reduce costs.

(To learn more about how nlyte supports all these steps, please download the following white paper from **www.nlyte.com**: *Moving the Data Center from Chaos to Control—Best Practices in Data Center Performance Management with Integrated Processes and Technologies)*

FIGURE 1. **nlyte DCIM Process Cycle**



ENABLING EXECUTIVES TO PLAN, INVEST, AND PROVISION AT THE DATA CENTER "MACRO" LEVEL

How does the nlyte DCIM Suite help you make optimal data center investment determinations that minimize business risk? By enabling you to plan more effectively and make informed decisions—even those involving millions of dollars—with the confidence that you will achieve your desired outcomes from a cost, reliability, availability, and scalability perspective.

With the nlyte DCIM Suite, you can precisely forecast the capacity of your data center and analyze the impact of proposed changes so you can plan ahead—not just react. Predictive functionality provided by nlyte enables you to take into consideration all of the free-standing and cabinet-mounted assets on the data center floor and establish a real-world baseline for space and power consumption. Once this baseline is established, you can build accurate forecast scenarios that predict the impact of changes (such as moving equipment in and out of the data center) over months or years.

For example, using detailed what-if scenarios for a large project, you can understand exactly how well plans and capital investments will meet your business needs and impact reliability, space, cooling, energy, network capacity, and

costs. You can also reduce risk by having definitive answers to critical questions such as:

- Can we postpone investments in an expensive reconfiguration, expansion, or replacement project by making more efficient use of our current data center resources? If so, for exactly how long?
- What's our current data center total cost of ownership (TCO)? Exactly how will it improve if we make the investments you suggest?
- How much are we currently spending on energy in our data centers? The CFO only sees total utility bills—not a breakdown by business area.
- Will we have enough power from our utility company to meet our growing needs? Or do we need to move to a new location?
- What's the real ROI of replacing our old servers with new, more energy-efficient boxes? I'm not sure this is the best way to spend my funds.
- We're launching a new line of business next year that will require lots of new applications for heavy internal and customer use. What's the impact if we need to roll out new business applications simultaneously?

Table 1 summarizes the kinds of cost savings that customers are realizing today—once they have the visibility, control, and predictive insight provided by the nlyte DCIM Suite.

"Energy savings from well managed data centers can reduce operating expenses by as much as 20%.[1]"

A TYPICAL SCENARIO: DATA CENTER CONSOLIDATION, MIGRATION, AND VIRTUALIZATION

Let's take a closer look at how the nlyte DCIM Suite can help you—as an executive—benefit from these kinds of insights and analytics. Some of the most common data center initiatives underway within companies today are data center consolidations and migrations—often with a virtualization component.

As infrastructures age and energy prices skyrocket, many CIOs and executives are considering migration and consolidation initiatives to help stem the tide of rising costs related to operating their data centers. Most companies have far too many data centers scattered across different geographic areas—the unintentional consequence of mergers and acquisitions. The potential for cost savings is considerable; on average, servers are used at just 6% of their capacity, and data center facilities as a whole are used at just 56% of their capacity. Low utilization drives up costs considerably, as the real cost of a server is its annual operational cost, which typically exceeds the purchase cost in just two or three years.

TABLE 1. Typical Cost Savings by Companies with Different Size Data Centers Using the nlyte DCIM Suite

DATA CENTER TYPE	AVERAGE NUMBER OF RACKS	ANNUAL OPERATING EXPENSES (ENERGY) PER RACK	ANNUAL OPERATING EXPENSE	ANNUAL SAVINGS AT 20%
Small Data Center	250	$ 6,000	$ 1,500,000	$ 300,000
Medium Data Center	1200	$ 5,917	$ 7,100,000	$ 1,420,000
Large Data Center	2000	$ 10,900	$ 21,800,000	$ 4,360,000

ASSUMPTIONS:

- Typical server form factor = 3U
- Maximum servers per rack = 14
- Cost per kilowatt hour = $0.09
- Space needed per rack = 30 square feet
- Data center capacity utilization = 75%

[1] DCIM: Going Beyond IT; Gartner; David J. Cappuccio; March 2010.

Consolidation can dramatically increase utilization, and as a result, it can substantially lower data center costs.

At the same time, other organizations have business-critical data centers that are running out of space, energy, or cooling capacity. They need to migrate their data centers to a new location or outsource their data centers to a trusted provider—no small task.

"According to a study conducted by AFCOM Data Center Institute, a majority of U.S. companies (53%) expect to relocate or expand their data centers during the next several years.[2]"

As an executive responsible for approving budget for changes like these—as well as assuring continued high reliability and performance of business-critical systems—you need reliable, fact-based answers to questions such as:

- By consolidating our 20 data centers down to two, exactly what kinds of cost savings and efficiencies will we experience? How do you know that these two data centers will meet our needs today? Three years from now?
- If we moved the data center, are you sure the new location will accommodate the number of servers you are planning to install?
- Exactly how much power will we need to run your planned configuration? How have you been able to confirm we can access that much power at the new location?
- What are the pre-move baselines you'll use to measure success for each line of business? They need to understand the business value before you move data centers.

But if your data center managers are using traditional tools, such as spreadsheets and Visio drawings, to manage your data center, planning a complex data center consolidation or move can be a potential nightmare. They simply can't accurately plan in ways that address concerns like these in a fact-based way. It's all too easy to underestimate (or overestimate) the capacity required to support a move or consolidation, the time it will take, the skills required, and the inter-relationships between the software applications and the systems supporting them. No wonder the number-one reason cited for failed or over-budget data center relocations and consolidations is "Poor or Inadequate Planning."[2]

Understand Exactly What You Currently Have

The nlyte DCIM Suite makes it easy to plan migrations and consolidations down to any level of detail so you can confidently approve and fund them. Using nlyte Discover, your IT department can remotely collect asset data for every piece of networked equipment in minutes and load it into nlyte to support the move. (nlyte Discover can also be used to periodically audit the hardware and report on exceptions so your data is always up to date.) Leveraging the nlyte Floor Planner and nlyte DataCenter (Cabinet Planner) modules, your IT department can use this data to visualize how your racks are laid out on the floor and how your servers and other physical assets are laid out in the rack. They can also identify other hardware assets, such as printers, that you need to plan for during the move.

Use Predictive Analytics to Accurately Forecast and Plan

nlyte Analytics comprises of three fully integrated modules (nlyte Report, nlyte Dashboard & nlyte Predict) that allow you to quickly gain visibility into the information and key performance indicators that help optimize critical resources. For example, you can use predictive analytics—in conjunction with the modeling capabilities—to gain insight into the remaining life of your data center today and in relation to planned events. Armed with this insight, you can make informed decisions regarding the necessity of costly migrations and consolidations before you commit to funding them.

Should you decide to fund the initiative, your IT department can use inventory data collected with nlyte Discover to run reports on server utilization and determine if any of your servers are orphaned or could be decommissioned before the move. IT can also get a complete picture of the software installed on each server, including virtual operating systems, to understand the real impact of shutting down these systems for the move. Reports also specify which server owners and support personnel must be notified of service interruptions caused by the move.

Data center managers can then use nlyte DataCenter and nlyte Floor Planner to create a detailed model and plan for a successful data center consolidation or migration. Using various "what-if" scenarios, they can virtually consolidate all the servers in your server room to fewer racks; model the power, cooling, and network connections for these racks; and search for space on the floor in the new data center to place this hardware. This allows everyone to see the true impact of proposed changes on heating, cooling, power, network connections, and space—all before you implement changes.

[2] The 5 Pitfalls of Data Center Consolidation and Relocation, CIO Magazine, November 19, 2008.

Execute Optimally to Minimize Risk

Once everyone has a clear picture of the impact of moving this equipment to the new data center, data center managers can use nlyte Control to execute the plan in the right order, controlling the process from start to finish using ITIL-based best practices that minimize risk and cost overruns.

nlyte Software in Action: A Case Study

As one of Europe's leading independent providers of IT Infrastructure Services, Computacenter, needed to support growing demand for its services and changing business requirements while maintaining competitive pricing. To gain more control over datacenter resources, accurately understand current and future costs, and understand the capacity of its physical infrastructure (i.e., racks and servers), Computacenter needed a tool that would help them visualize their entire data center estate. The solution also needed to support comprehensive reporting on current usage and forecasting of future requirements for power, cooling, and space.

After reviewing several alternatives, Computacenter selected the nlyte DCIM solution because it offered sophisticated power management functionality and seamlessly integrated with Computacenter's existing systems, including BMC Remedy and the Biomni-based request management system.

Today, the nlyte DCIM Suite provides data center managers with a comprehensive view of all managed assets, automated solutions that streamline everyday management tasks, and enforcement of standard processes and procedures. The software also features new and enhanced functionality supporting power management, real-time equipment monitoring, data center floor planning, and managed integrations.

"The nlyte solution with its advanced visualization capabilities and real-time environment will enable us to further improve the management of our data center estate and more accurately forecast and plan for growing demand" said Simon Brickett, Head of Datacentre Managed Services for Computacenter. "In today's cost and environmentally conscious world, organizations are looking for cost-effective, reliable and secure datacenter solutions, and nlyte is helping us to enhance the datacenter services we offer to our customers."

With nlyte, you can model and map out an entire data center consolidation or migration and see exactly how it will work—all without having a single person step out onto the floor or move a server.

EXTENDING THE LIFE OF DATA CENTER INVESTMENTS

The nlyte DCIM Suite can also help you get greater operational value from your current data center investments. In many cases, improvements lead to substantially reduced costs and enable companies to postpone large capital investments for months and even years. For example, the software can help your IT department:

- Reduce business risk and avoid over-provisioning by predicting future needs and optimizing capacities
- Proactively manage energy and cooling resources and costs

REDUCE RISK BY PREDICTING FUTURE NEEDS AND OPTIMIZING CAPACITIES

When it comes to data center capacity, predicting the future can be the difference between "open for business" or "out of business." That's why the nlyte DCIM Suite provides intelligent capacity planning. Using nlyte Predict, you can accurately plan for future needs and understand exactly how they will impact overall data center capacity and costs. Using built-in analytical tools and a library of standard reports and dashboards, you can leverage historical data to track trends and forecast future requirements for power, cooling, and space.

For example, tracking and trending reports and dashboards enable you to instantly see real-time metrics on current energy usage as well as future energy and cooling requirements. And purpose-built capacity reports and dashboards give you immediate insight into the status of your resources, such as network connections, power usage, cooling, and space within specific rooms and cabinets. Armed with this information, you can determine—with a high degree of accuracy—how long you can get by with your current data center infrastructure and how long you can postpone large capital investments without jeopardizing operations.

Your IT department can also better manage operational issues within your data center. For instance, with the nlyte DCIM Suite, IT can create sophisticated "what if" scenarios to plan future move, add, change (MAC) initiatives and understand their impact on heating, cooling, power, space, and other applications—all before you commit your team to implement changes.

The nlyte DCIM Suite also provides an auto-allocation function that tells your data center managers where to add new assets so that they have the lowest overall impact from a heating, cooling, and power perspective. Auto allocation saves everyone a great deal of time and effort and mitigates risk, as it prevents staff from setting up a server in a location that's already running hot, or where there's insufficient power or cooling. These kinds of "accidents" can cause you to exceed power capacity for the cabinet and cause everything in it to shut down.

To help you identify potential threats, nlyte also includes real-time ad hoc capacity reports and dashboards. As work continues within your data center, nlyte monitors the different performance thresholds that apply to each device. If your operations result in these thresholds being approached or exceeded, nlyte color codes the affected device(s) on the appropriate layer of the report's graphical output. From the color-coded results of each report, data center managers can quickly identify any jeopardized asset and drill down to get more detail.

PROACTIVELY MANAGE ENERGY AND COOLING RESOURCES AND COSTS

If you actually see the monthly bills, it may be easy to track total power and cooling costs for your data centers—but in most cases, C-level executives just see a single line item for all energy costs. Given that around 40% of total data center costs are energy related, reducing power usage via consolidation can result in substantial cost savings. The challenge, then, is how to gain detailed, real-time visibility into your energy costs and utilization rates so that your IT department can make decisions and changes that lower costs—without jeopardizing reliability and performance.

With the nlyte DCIM Suite, your IT department can create an accurate, visual representation of your data center that's linked to your physical data center assets. This linkage enables IT to:

- Have an instant, accurate view of real-time energy consumption throughout your data center and compare it to manufacturers' estimated device data
- Instantly report on power usage effectiveness (PUE) and data center infrastructure efficiency (DCIE) so they can take actions that align key metrics with targets determined by The Green Grid and other industry bodies
- Find and shut down orphaned servers you're paying to run but aren't actually using (in the average data center, about 10–15% of servers are orphaned[3])
- Control physical assets remotely so that they don't exceed your power and cooling specifications—right down to the cabinet level (for example, IT can model your data center and set the individual power and cooling limits for each cabinet, leveraging vendor catalog data associated with each device under management)
- Instantly see the capacity impacts of new or planned devices on individual cabinets, as well as the data center as a whole
- Accurately visualize and understand how data center changes—such as replacing old servers with new, energy-efficient servers, or consolidating data center locations—will cut energy costs

BOTTOM-LINE BENEFITS

When you can base your decisions regarding capital investments and other data center changes on trusted data and predictive analysis, you can fine-tune and execute plans that deliver significant, bottom-line results. For example, nlyte customers typically realize the following benefits:

- Reduced the cost, time and risk of migrations and consolidations by up to 50%
- Decreased the business risk and expense caused by downtime & catastrophic failure by up to 50%
- Deferred the capital expense for new data center build outs by 5 years or more
- Cut power expenses by 20% annually and reduced power usage effectiveness (PUE) to 2.0 or less
- Improved the operational excellence and optimized power, cooling and space

[3] The Green Grid Technical Forum, January 2010

LEARN MORE

The nlyte DCIM Suite offers the integrated functionality you need to manage all data centers as a single corporate entity. As an executive, you gain the visibility, forward-looking insight, and confidence needed to make decisions about large-scale data center investments—both now and in the future. At the same time, your data center managers can proactively manage day-to-day operations in ways that maximize data center life and allow you to safely put off costly investments until you're ready to move ahead.

To learn more about how you can leverage DCIM for your business, please visit **www.nlyte.com.**

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