



December 9, 2009

Put DCIM Into Your Automation Plans

Data Center Infrastructure Management Should Be A Part Of Your Architecture

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EXECUTIVE SUMMARY

Data center infrastructure management (DCIM) tools are system management platforms covering rack, cooling, and electrical infrastructure for your data center facilities. Most companies have implemented some IT process automation, but this automation stops at the IT device level and does not extend down to the facilities level. Sure, there's process, but it's all based on spreadsheets and Visio diagrams — maybe. Today, DCIM brings better visibility and reliability to the facilities and helps with analyzing costs and capacity. More importantly, DCIM will eventually provide important data to higher-level decision-making tools. But the integration won't happen overnight, as there are numerous would-be providers of this information, and facilities teams are just now starting to implement these types of automated systems.

DATA CENTER INFRASTRUCTURE MANAGEMENT IS INCREASING IN IMPORTANCE

Data center infrastructure management is not well-known among enterprise architecture professionals — perhaps because it has been historically below the water line for IT. In fact, many firms don't even use specialized products — Microsoft Excel, Visio, or homegrown systems are widespread. In the past, these tools were sufficient because data centers were fairly static, and the rate of change didn't require more sophisticated automation. But thanks to technologies like virtualization, today's more dynamic infrastructure allows rapid-fire changes that affect the electrical and cooling systems that you rely on. Data center infrastructure management tools essentially extend system management to data center facilities. These tools provide monitoring, asset management, and IT workflow capabilities that are analogous to those supplied by enterprise system management vendors like BMC, HP, and IBM. The key functions of any DCIM tool include:

- **Maintaining an authoritative source of data center topology information.** Much like configuration management systems handle application or hardware configuration, DCIM tools maintain the details of what assets are in which racks, rows, or data centers. These details also include how many rack units these elements require, average power consumption, which electric circuits they use, as well as the physical network ports to which they're attached. In order to accomplish this, DCIM tools also maintain a floor plan of the data center that includes things like racks, power distribution, and network infrastructure.
- **Analytics to optimize power and cooling resources.** Using their knowledge of your IT assets, their locations, and their power consumption, DCIM tools can help optimize your power and cooling. Some, like APC InfraStruXure have integrated simulation capabilities that can identify potential hot spots, while others offer analytics and reporting that can identify capacity issues.

- **IT process automation.** Process automation has been slow to trickle down to data center facilities. Processes exist, but they are largely paper-based and have little integration with IT process. Today, it has become apparent that IT and facilities must coordinate processes for provisioning and decommissioning systems, as well as more complex processes like capacity planning. For example, vendors like nlyte Software use information about IT assets maintained by your IT processes to predict when additional capacity will be required.

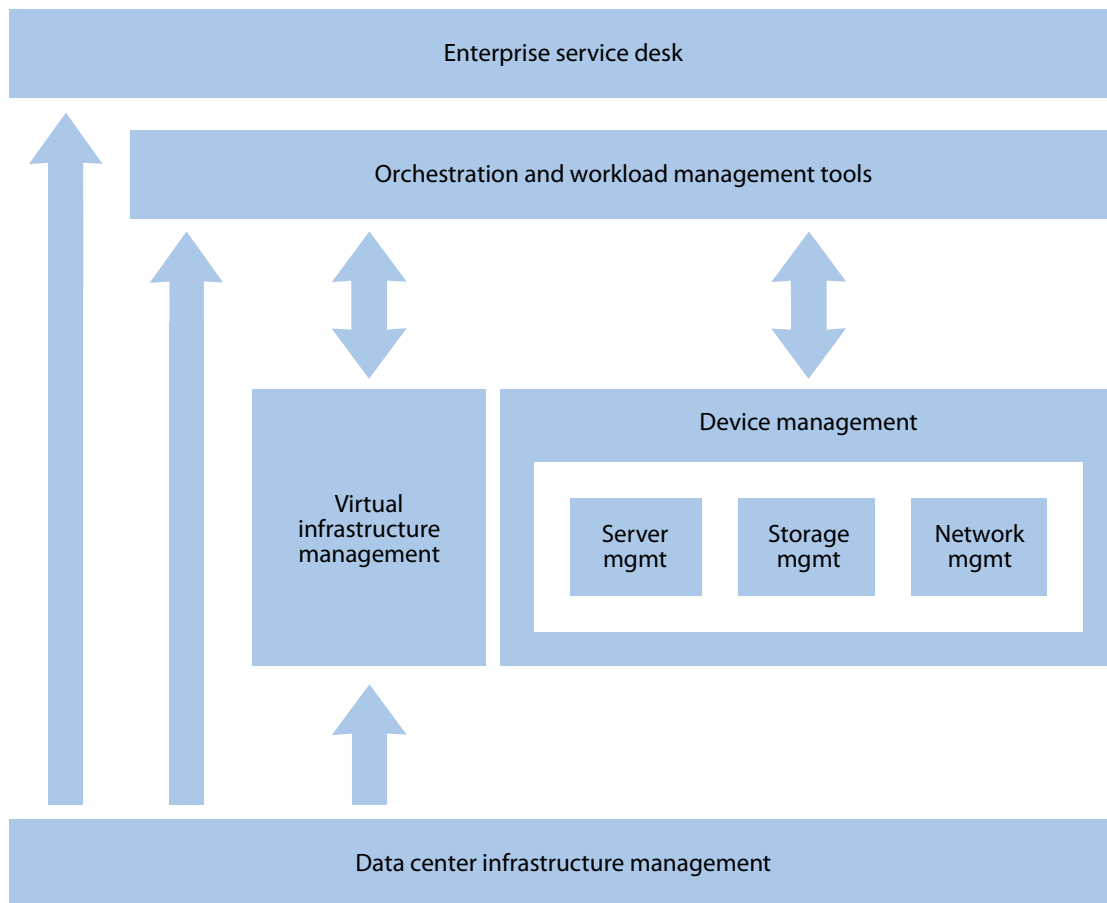
PLAN TO MAKE DCIM PART OF YOUR SYSTEM MANAGEMENT ARCHITECTURE

How does software for data center infrastructure management figure into your system management architecture? In the future, the information you gather with DCIM will be an important input to workload management algorithms used by virtual infrastructure management tools from HP, IBM, Microsoft, and VMware, as well as service desks that run IT processes (see Figure 1). In the short term, you'll improve capacity planning and extend the same IT process automation and discipline you've built for IT all the way down to the facilities that provide the basis for it all. Several key trends will cause this environment to evolve quickly over the next six to 18 months:

- **Market consolidation.** DCIM leaders are emerging from vendors like Emerson Electric and Schneider Electric that are traditionally associated with facilities infrastructure like power distribution units, uninterruptable power, and cooling systems. There are also a number of specialists such as AssetGen, Asset Point, nlyte Software, and Rackwise that have a strong likelihood of being acquired by larger systems management vendors that are now recognizing the importance of DCIM. For example, Emerson Electric acquired Aperture and is poised to acquire Avocent with its DSView and LANDesk software groups. APC, now a division of Schneider Electric, has built its own in-house planning, simulation, and change management tools.
- **Virtualization.** Virtualization has opened the door to more portable computing environments. In addition to hypervisors' own workload management, management tools like CiRBA and HP Insight Dynamics can model your server environment and determine the arrangement of VMs that will use your servers most efficiently without hurting service levels and will even power off unneeded systems. These decisions, however, are based on application and server metrics and don't factor in the physical environment. If you power off servers, you should take care to maintain balanced loading of your electrical infrastructure. And when you dynamically consolidate workloads onto a small number of highly loaded systems, you must take care not to create a hot spot in your data center. In the future, global companies will want to move workloads between data centers to take advantage of off-peak electrical rates. As a result, Forrester expects these types of workload optimization algorithms to start incorporating information about the data center into their algorithms — and DCIM tools will be the primary source of that information.

- **IT process formalization.** Many companies have implemented at least some ITIL-style processes for configuration management, incident management, or capacity planning purposes. Yet, these processes and their related automation capabilities only extend as far as the bottom of the IT technology stack, which for most does not include facilities. In addition to an increased risk of downtime due to errors, these firms also lack insight into capacity and their true cost of IT.

Figure 1 DCIM Provides The Foundation For Higher-Level Systems Management



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Source: Forrester Research, Inc.

WHAT TO LOOK FOR IN DCIM CAPABILITIES

In the near term, DCIM products will strengthen key capabilities that will make data centers more reliable and cost-effective while also facilitating capacity planning and chargeback for services. When evaluating DCIM products, assess the strength of their:

- **Workflow integration.** A DCIM platform allows you to orchestrate processes at the facilities level, but they need to tie into higher-level system management tools. For example, data center tasks like racking up a server or connecting a system to a certain patch panel should be tied into your IT service desk processes for provisioning. For many DCIM products, service desk integration is possible but requires professional services to accomplish. Others have a more sophisticated software development kit, but none yet offer drag-and-drop levels of integration.
- **Asset and topology management.** One of the fundamental capabilities found in DCIM products is the ability to record the technical details and whereabouts of a particular IT element, show what network and power connections it has, and graphically show it on floor plans or rack diagrams. Most products have large libraries of IT assets and their size, weight, and nameplate power consumption. Others provide more accurate power consumption based on benchmarks or allow you to poll smart power infrastructure for actual readings.
- **Analytics and reporting.** All DCIM tools provide reporting, so focus on the quality of their analytics for capacity planning and energy management in particular. Furthermore, some products like APC offer simulation for power and cooling or integrate with external simulation tools as is the case with nlyte's Predict module.
- **Partnerships with key vendors.** The long-term value of DCIM is tied to a product's ability to integrate with other system management tools or orchestration tools that optimize data center workloads. Today, DCIM adoption is relatively low, but the winners will be those DCIM platforms that achieve wide adoption and forge integration with key management vendors like BMC, CA, HP, IBM, Microsoft, and VMware. Who has the best chance? Companies like Emerson and Schneider have enormous data center customer bases that make them a necessary partner for the management vendors, while nlyte gets a seat at the table based on the strength of its offering and the likelihood that it will be acquired by a big player.

WHAT IT MEANS

DATA CENTER INFRASTRUCTURE MANAGEMENT IS ITS OWN MANAGEMENT TIER

Forrester believes that data center specialists are needed. System management vendors may attempt to gather some of this information directly through SNMP interfaces or other adapters, but we believe that this approach is unlikely to work out. The sheer number of components like HVAC systems, power strips, interruptible power supplies, power distribution units, patch panels, and transfer switches demands a specialist that understands them. Some of these elements are smart, some are not so smart, and most of them have already been incorporated into the equipment lists supported by DCIM tools, along with their communications protocols like Modbus, which is not widely used in other IT systems.

SUPPLEMENTAL MATERIAL

Companies Interviewed For This Document

AssetGen

Asset Point

Avocent

Emerson Electric

nlyte Software

Rackwise

Schneider Electric

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