Data center infrastructure performance monitoring is increasingly important, particularly for virtualized data centers. But performance monitoring has to evolve beyond servers to other aspects of infrastructure management. BY ALAN R. EARLS
ALTHOUGH IT IS possible to drive a car by “feel,” most people are more comfortable having instruments to indicate speed, the condition of the engine oil, temperature and so on. Likewise, IT operations often run on IT professionals’ gut feel. But as workloads grow more complex and become virtualized or moved to cloud environments, IT professionals’ understanding of the performance of the infrastructure that surrounds them has gotten more confused, and experience and instinct are less reliable guides. They need more than basic tools to get them through the day.

As a result, server performance monitoring and related disciplines are becoming critical. Data center performance monitoring is a “central nervous system” activity, enabling IT professionals to keep a watchful eye on the performance of servers as well as other critical infrastructure components. Monitoring tools are increasingly necessary to manage virtualized resources that are dynamic and changing at a moment’s notice. Performance monitoring enables IT professionals to monitor resource use and performance as well as to proactively shift workloads to prevent performance problems and bottlenecks and to anticipate changes in workload demand. Performance monitoring also helps organizations capacity-plan and allocate their data center resources for future scenarios. In sum, these tools help IT pros control the chaos.

But how to approach performance monitoring—and what to focus on—is not always clear.

On the front lines, Michael Ferguson, the director of IT for Rennert Vogel Mandler & Rodriguez, P.A., a Miami law firm, explains that his organization has made a commitment to virtualization. “Everything we have is virtualized or will be, from our SQL database and related time and billing
applications to our Exchange server, which is slated for migration to a virtualized environment soon.”

And in that new virtualized world, monitoring is a challenge. Ferguson said that his production servers are in a colocated bunker and also in a separate location in Boca Raton, Fla. “My daily concern is keeping consistent bandwidth between Miami, where we have 60 people, and our server in Boca Raton. We are always tweaking and watching—and fortunately we have high availability in both VMware and storage virtualization in the form of SANsymphony from DataCore,” he said. Monitoring capabilities built into both products are currently his mainstay, because his biggest concern is running short on storage.

“We have spikes and valleys not so much in performance but in the flow of what is happening at that particular moment,” Ferguson noted. “For instance, if the real estate department is handling a lot of closings and paralegals are executing a lot of documents within the software, we see spikes. But that is only occasionally,” he said.

Future performance is also an area of concern. “I have to anticipate things like how [VMware] vCenter running ESX servers is performing. Last week, the reports indicated I needed to increase RAM, so I have ordered more,” he noted.

So, although Ferguson said he gets by just fine with his existing management tools, he admitted having a single tool that could provide a comprehensive overview of operations and performance would be a big help.

Fortunately, that kind of capability is coming. In the report “How to Augment APM with Conventional Monitoring,” Gartner research director for IT operations management Jonah Kowall recommends a holistic approach rather than just considering one facet of operations, like the server. Instead, he said, monitoring of critical production systems should be pervasive, with a particularly visible role for application performance management (APM) and monitoring, since it is the application that ultimately touches end users.

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In fact, he noted, it is a combination of server, network, database and storage monitoring, along with more in-depth app performance monitoring that can deliver a complete view of the application and its performance.

Forrester analyst Glenn O’Donnell takes a similar tack—and noted that this kind of monitoring is a key element but is only effective as a team player, when used in concert with other monitoring methods.

O’Donnell said that he has witnessed a huge expansion of interest in analytics: advanced algorithms that can “help analyze the mess on the back end, including understanding
behaviors and why things are happening.” It is there that application performance monitoring and other kinds of monitoring are increasingly coming together, he said. “APM tells you that you have an issue and, in theory, the analytics will tell you why and will help you drill down and map the problem,” he added.

Similarly, O’Donnell said the market has plenty of server monitors. The key players are the usual suspects in management: Hewlett-Packard, CA and BMC Software, and there are even a number of open source options, particularly Nagios, which is getting very popular but “suffers from complexity,” O’Donnell said.

However, he cautions, analytic capability for monitoring is still in its infancy.

The key is encouraging IT professionals to acquire more sophisticated analytics capability as they can get it. O’Donnell said there are a lot of useful management features coming from big companies, like IBM with its Tivoli management software—but most of the innovation is still coming from little “peanut companies.” Over the next few years, the further development of analytics will make monitoring much more exciting, he added.

For Ferguson, having that kind of broad capability, to supplement what’s built into his SANsymphony storage manager, would be very desirable, he admitted. “The second thing on my wish list after ‘Don’t bust the budget’ is a dashboard app that would reach into the infrastructure and provide at-a-glance reports I can drill down into,” he said.

Additionally, he said, the ability to look at application performance would be a plus. The billing, accounting and financial management software application at his firm “gets used constantly, but not with a big hammer; lawyers and paralegals just add billable time during the day and at the end of the day, accounting functions take over. So if a utility included application performance, that would be a plus,” he said. And that capability would be even more welcome for what he describes as his “most demanding” applications—built on SQL Server and Linux-based MySQL—“especially during end-of-month closing activities.”

“In the end, if you have a good dashboard, things go well. The instruments on your panel, if you trust them, can get you a long way,” he added.

MOVING TO THE CLOUD

Kowall said as cloud has matured the focus for management has moved from simply thinking about the status of virtual machines to the more important question of how applications themselves are faring.

Therefore, monitoring must understand not only what has been employed for infrastructure but also whether the application is being implemented in the best way, he said. As cloud solutions and packages evolve, they need to consider monitoring and application performance monitoring
as part of the picture rather than as something that can come after the fact. “Many monitoring approaches are still more focused on the infrastructure rather than the app, but that will change as that private cloud matures,” he said.

Whenever you are dealing with shared resources, which a cloud is, performance fluctuations can have a wide impact on other things running on that hardware, so you have to consider not just looking at it from an infrastructure perspective, noted Kowall. But application performance is critical and looking at user experience is the most relevant metric of all, he said.

Kowall said that organizations should aim for a monitoring strategy that can transition from “whatever your current state is to something more advanced.” The strategy and deployment should include monitoring subsystems, an event console, and specialized monitoring tools and should use APM tools that can monitor multiple technologies. That will help reduce training and other costs associated with more monitoring, he said.

Likewise, he noted, it is important to stay attuned to application owners and their expectations and goals relative to the cloud.

For two consultants at GlassHouse Technologies, based in Southborough, Mass., it is all about those expectations and goals as clients move to embrace virtualization and the cloud. “In my experience, we have had only a few clients that actually did in-depth monitoring with third-party tools,” said Mike Valuck, GlassHouse practice lead for virtualization. The ones that did, he noted, had a dedicated team that watched and understood the tools “way down into the weeds. They were looking at all the dots and dashes—and they are the exceptions,” he said. In fact, most companies end up with something off the shelf and configure it at its most basic level, where it will send out a simple alert from time to time—but the alerts and the response to the alerts tend to be unsophisticated.

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—JONAH KOWALL, research director for IT operations management, Gartner Inc.

“If you want to understand that there are seven different kinds of Cisco alerts, that takes specialized people, and most organizations don’t have that,” he said.

Valuck emphasized that it isn’t that IT people aren’t “interested,” it is a matter of capabilities and bandwidth. “People who are doing more monitoring are getting metrics and reports and are looking at them but it isn’t looking in depth,” he said. While they may want to know why a database transaction is taking so long, unless they have specialists on board, they won’t be able to glean more sophisticated...
answers. Whatever it [the monitoring product] does, it does out of the box; they won’t understand much beyond that, he said. “That is where we sometimes find clients with five different monitoring tools, and you ask what they are doing with them, or do you look at them, they will usually just say, ‘Well, we get reports,’” Valuck said.

In fact, according to Valuck, most companies still monitor and report only on capacity issues “whether it is bandwidth or disk capacity or CPU utilization.” However, he noted, that’s entirely rational since that is usually how they are being charged, whether they are building infrastructure internally to meet peak loads or using a cloud service like Amazon. “They pay for a certain number of processors or a certain amount of memory or maybe they are paying for I/O; so, from a financial perspective, there isn’t a lot of incentive to monitor strictly on performance, except in a few cases where it really does come down to a dollar figure of how fast you can get a transaction through, like stock trading speed,” he noted.

Ken Copas, cloud services director at GlassHouse, agreed—most companies, at least in virtualized or cloud environments—are not attuned to real performance or the end user. Indeed, he noted, one of the exceptions he has encountered was an airline company that wrote elaborate scripts to allow them go to other airline websites and see “what it takes to get an airline ticket.” But the focus was external, on the competition.

There are tools, for example from VMware, that can help you to see where things are hanging up in your own infrastructure, and you can use other tools to get website performance insight, “but those things, if they are used at all, are mostly confined to retail companies,” he said.

Copas said when you are talking about private cloud or private infrastructure, whether virtualized or not, the benefits of monitoring and measurement don’t really change from the in-the-data-center model. And of course, if you are doing private cloud, it is still on-premises, so it really is part of your infrastructure.

“When you go to a third party or cloud service provider, you either need them to provide that monitoring capability for you, or you need some mechanism to measure inside your provider’s environment. And when you go that route, you are taking more of an end-to-end, transactional type of performance monitoring rather than looking at individual performance stats and adding it all up,” Copas noted. “I have seen customers that do that, but they are few and far between—most don’t have the mechanism or the plans to actually monitor at that level,” he added.

In the cloud, he noted, the good news is that it is also easier to collect end-to-end transaction performance data when it is Web-based than when it is internal.

“There are many apps out there that will measure Web performance, because you can just look at the HTML coming into the Web server and measure from first click to last
action,” he said. By comparison, with a SQL database, for example, “you have to crawl through the transaction logs, which is much more difficult,” he added.

FUTURE POTENTIAL
Still, in the cloud, Copas said he envisions a future for monitoring with a greater focus on the end user. While traditional data centers have tried to get monitoring technologies for each individual component; it is a best-of-breed approach rather than a unified viewpoint.

“Storage tools, backup monitoring tools, network tools—all of those speeds-and-feeds types of performance monitoring—are interesting, but not so much in the cloud because at the end of the day users don’t care—only performance monitoring would ever translate into dollars,” Copas said.

Focusing on monitoring gives too little attention to the factors that make monitoring necessary.

Unfortunately, he noted, planning is “more black art than science” because it is dominated by the illuminati—the high priests of technology, who are not always natural planners. “It is an issue of human behavior that crops up in many fields,” he added.

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