

Monitoring IT: Why the current demands and constraints on IT professionals need a new approach

Introduction

The watchwords in government now are efficiency and cost-effectiveness, and with the federal IT budget at over \$81 billion in Fiscal 2012 it's become an obvious target for the austerity-led actions of Congress and the Administration to cut government spending. Despite the overriding importance of IT to agency missions, the constraints on budgets are unlikely to ease in the foreseeable future.

That push for higher efficiencies and lower costs is manifested in such things as the Obama Administration's Federal Data Center Consolidation Initiative (FDCCI), which seeks to substantially cut the number of government data centers, and increase the use of technologies such as virtualization, in order to squeeze more production from existing IT systems.

The administration is also driving agencies towards an expansive IT shared services strategy. It's an attempt by Federal CIO Steven VanRoekel to get agency CIOs to break the habit of deploying new servers and software to fill a requirement, and instead use existing platforms to deliver that service. That adds to the efficiencies targeted by FDCCI and virtualization, and brings into play other technologies such as cloud computing.

Done right, these and other programs will result in a leaner and better functioning government. Agency users of IT will see, at the least, no change in how well the applications and systems they use to do their jobs work, and could see significant improvements in how they can deliver on their agency's mission. The public and others who depend on seamless access to government services should also see improvements.

For IT professionals in those agencies, however, the stakes are raised. At the same time as their budgets tighten, which will put a firm lid on the funding and personnel that will be available, they'll have to operate in a far more complex environment than they have been used to. Consequently, keeping those applications and systems humming along and secure will be more complicated.

When it comes to performance, location is everything

For one thing, there will likely be a major impact on network bandwidth when moving to this more consolidated, shared services environment. When it comes to bandwidth, location is everything.

There's a big difference, for example, between users being able to access applications hosted in a local data center over a high-speed connection and having to access them when they are housed in a data center that could be hundreds or thousands of miles away over connections that could be much slower. That's what data center consolidation implies.

There's also no argument about the benefit that is derived from moving applications to a virtual environment in order to make more efficient use of servers. With virtualization you can easily readjust how much processor power and memory each application gets based on how much it actually needs at a given time. That's a much more efficient use of resources compared to the traditional way of over-allocating resources.

But virtualization brings its own location problems. Virtual servers can shift from one physical machine to another as circumstances dictate, and those machines could be in different data centers. There will be no way of knowing what bandwidth may be available to those applications.

It's the complexities introduced by all of this that can undo things. In an unconsolidated data center, the applications people use now and the servers that host them may be inefficient from a cost perspective, but they likely work well and reliably. The IT professionals who look after them know who needs to use the applications and where they are located, and what the server, memory and network characteristics are to make sure those applications run well.

When data centers are consolidated, and when applications move to a virtual environment, that certainty goes out the window. Servers may no longer be in the same location, and IT people who don't know the applications and their users so well may now be in charge of allocating resources for them. Memory and disk space may be less than is needed, and network bandwidth may be slower. The server itself could be a problem, or the database, or a dozen other causes. Once applications and servers go outside of the local environment those IT professionals have been used to operating in, so can the visibility they have into those problems.

If you can't detect and measure, you can't mitigate

Every time you move applications and services around you change the way you use the IT infrastructure. Without knowing what that change means, if you can't measure how busy each part of the infrastructure is and who is using what, you can end up with hot spots that have to be damped down, and if you don't know why that hot spot occurred you may simply create another somewhere else. Without the ability to see which application is running slow, or causing a particular problem, an Administrator would have a hard time resolving any issues that may arise from such a consolidation, which may create a self-reinforcing circle of problems.

It's critical, therefore, to intimately know an application and what its requirements are in order for it to perform well. To establish that kind of performance baseline, you'll need to know such things as who uses the application, where they use it from, how much network bandwidth it needs, how much storage and I/O it needs, how much processor capacity, memory, and so on. This kind of information is needed for each application, both from the administrator and user point of view.

To get there, you'll have to monitor the legacy production environment so you know both what makes the application perform consistently well, and how to monitor it. Then you'll have to continuously monitor the application as changes are made to it and the environment it runs in so you can measure any negative effects on its performance. Give the constraints on how many people can be devoted to this, monitoring will also have to be automated.

You don't have to look far to see what this lack of insight can mean, even without inserting all of the complications of data center consolidation and virtualization.

Several years ago the Army embarked on an ambitious program to move all of its service people and employees to an enterprise-wide email system. Though that transition is going well now, it hit major problems along the way because the range of configurations of desktops throughout the service was much greater than first thought. That, in turn, caused delays in implementing the system because of unreliable operation and email delivery. The Army also found that local networks were not configured properly to make best use of cloud-based services, so those problems also had to be fixed.

To tackle all of the potential problems, the Army developed a tool to run checks at the various locations to make sure they complied with a baseline configuration, before migrating them to the new email system.

In the context of what is going on today, with consolidation and virtualization, the precise measurement of how much bandwidth and other resources are needed for each application is both an operational and financial imperative. If you move an application to save money and improve efficiency, but it becomes unusable as a result, what's the point? And, if you have to do such things as buy enough extra bandwidth to make sure each application can run as needed, but the cost of that outweighs the savings you are targeting, perhaps you need to rethink things.

Email service, while important and can have significant impacts, is not something that will force most agencies to shut down if it's interrupted for a while. The failure of other, more mission critical applications will, however, and it's that eventuality that brings nightmares to those IT professionals involved in the government's push to do more with less. So, knowing the impact that applications, the network and other resources have on each other, and having the right tools in place to help those professionals measure performance accurately and troubleshoot problems, is essential.

Traditional tools come with hidden costs

There is, in fact, no shortage of monitoring tools available to organizations. Server vendors such as Dell, IBM and Hewlett-Packard all provide tools for monitoring the health of their systems. Virtualization companies such as VMware provide tools to manage virtual machines and capacity planning. There are also tools for monitoring such things as operating systems and application performance.

The problem is that most of these tools are 'expert friendly'. Those who take the time to learn the intricacies of these various tools can do amazing things, and have an amazing visibility into how well things are or are not going. But that's not the case with the average IT operations professional, those who make sure everything keeps working. Their day is usually full of many different things they have to take care of, and their concern is about productivity and the efficiency with which they get those things done.

That leaves little or no time to learn the intricacies of these various tools, and to keep them up and running. Many of them are basically just frameworks for monitoring, and they have to be regularly maintained in order to know what they have to talk to and get information from, in an environment where various pieces of IT equipment continually come and go.

So there's a tradeoff IT managers face: Will the man-hours they have to devote each week to people babysitting these tools pay off in greater productivity? And if they don't want to take their own people out of the line to do that, can their limited budget afford the vendor consultants to do that?

The reality for most IT organizations is that neither of these scenarios is feasible anymore, which means tools get out of date and become ever more blind to the various systems configurations. And when a new application comes online, no-one has the time to do the research necessary to manually update the tool so it can monitor the application effectively. Most tools don't have the intelligence to do that for themselves.

For IT organizations it's a vicious circle. Most tools — which have a yearly license cost as well as the upfront cost of the software — won't provide any realistic ROI because the labor and dollars spent in keeping them relevant don't provide the productivity returns. So IT managers don't spend the time to have people trained on them and keep them updated, which means they won't be helpful to the organization if they are needed in a crisis.

Conclusion

Government agencies are caught between a rock and a hard place. Gartner Research has projected that just under half of all IT outages through 2015 that affect mission critical services will be due to configuration management issues. That implies that more effort has to be directed towards infrastructure monitoring.

As budget constraints bear down, however, IT managers have fewer options open to them. Buying more of the expensive tools they already have isn't one of them, given all of the other demands on their funding. They could train people to be better able to use the tools they do have, but that requires pulling them away from their other daily duties. Also, in a time of constraint, training budgets are one of the first things to suffer.

But the environment they have to manage will only get more complex. As data center consolidation expands, and as the use of such things as virtualization and cloud services grows, the certainties of the older and more familiar environments they are used to managing will fade. Finding a better way to monitor that new environment is something they can't avoid.

Given the personnel and budget dilemmas they face, the characteristics of the tools IT managers need to do this job are clear. They need to be much cheaper than the traditional tools they have invested in, they have to be much easier for IT workers to use, and they have to be able to adjust to changing environments without those workers having to put in a lot of time to manually update them.

The SolarWinds Approach

SolarWinds products are aimed at solving a broad range of challenges for application, server, network, storage and virtualization management, using a unified approach that pulls all of the necessary monitoring elements together in a single interface and deploying real-time, interactive dashboards.

Everything is intended for ease-of-use. The company's server and application management tool, for example, can be up and running in less than an hour, using integrated expert advice that guides users to set the tool up with the most appropriate answers for the what, why and how of monitoring for a particular environment. It can monitor

hardware from multiple vendors through that one interface, as well as the various virtual servers and applications created with VMware and other providers' virtualization solutions.

Once deployed, the tool will automatically adjust to changes in the environment. It will also stop servers when potential problems are discovered, mitigate those problems, and then quickly restart the servers.

The company is also leading a growing trend in enterprise software sales that allows users to try out the software to see if it meets their needs before actually buying. Widely used now in the sale of

commercial applications, government agency IT professionals can download fully functional versions of SolarWinds software and use them free for 30-days.

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