

Virtualization, Network and Infrastructure Management

Look before you leap

While virtualization has been a hot topic in the IT sphere for a number of years, we're still only at the beginning of the journey when it comes to understanding how to manage these new infrastructures. Barb Goldworm (Focus) talks to Sanjay Castelino (SolarWinds) about virtualization, network and infrastructure management.

BG By way of introduction, FOCUS is an analyst firm which I started 10 years ago. We focus on virtualization, systems and storage management, and IT strategies for successfully implementing new game-changing technologies. Our goal is to help IT organizations understand the best way to leverage these new technologies and build a platform for running their data centers more efficiently and effectively, while reducing costs.

Sanjay Castelino, Vice President of Product Management and Marketing at SolarWinds, is an industry expert with knowledge and solutions to help users successfully change the way they manage their new, evolving virtual infrastructures.

SC Let me give you a quick introduction of SolarWinds. We are a leading provider of IT management solutions—network, systems and applications, and storage management—for companies of all sizes.

We have more than 95,000 customers around the world and do things a little bit differently. We like to allow prospective customers to evaluate our software, try it, and if it works for them—buy it. There are none of the long traditional enterprise sales approaches.

This is a decision where we feel the IT practitioners know what they need and the problems they need to solve, and we help them do it quickly and effectively.

BG SolarWinds comes from a strong network management background for the last 10 years or so, is that right?

SC That's right. The company started in the network management area and has added functionality over time to manage servers, virtual environments and application infrastructure, and recently this year acquired a company in the storage management area as well.

BG I started with virtualization about 30 years ago back in the mainframe area, but x86 virtualization has actually been around for about the same length of time as both of our respective companies—about 12 years.

Over those 12 years, I think everyone would agree that virtualization has evolved to be one of the most significant factors in IT organizations today, having a huge impact on IT, both technically as well as organizationally.



Moderator
Barb Goldworm

President and Chief Analyst — FOCUS

Barb Goldworm is a well-known industry expert, frequent keynote speaker, author and columnist on virtualization, systems management and storage, with over 30 years in technical and marketing positions with IBM, StorageTek, Novell, EMA and other successful startups. She is Virtualization Chair for Interop and COMDEX, created the storage networking track at Interop, and has been one of the top rated speakers at Tech Target Data Center Decisions, Storage Decisions and Storage Networking World.

Barb has written regular expert columns for NetworkWorld, Computerworld Storage Networking World Online, Tech Target and others, and has published hundreds of articles, business and technical white papers and market research reports, as well as the Wiley book Blade Servers and Virtualization.



Sanjay Castelino

Vice President of Product Marketing and Product Management — SolarWinds

Sanjay leads the company's initiatives around its end-to-end IT solutions for network, systems, application, storage and virtualization management. He is responsible for all of product marketing, product management, technical marketing and community marketing functions at SolarWinds.

Previously, Sanjay worked at NetStreams where he was VP of marketing and business development. He was also the VP of product marketing and management at Motive where he helped to lead the telecom business through its inception and acquisition with Broadjump.

In fact, the latest research from FOCUS shows that over 90% of organizations have implemented server virtualization in production, at least to some extent.

So as these companies move forward in virtualizing more and more servers and applications, and particularly as they make the jump from initial server consolidation to virtualizing mission-critical apps, management of that new virtualized infrastructure obviously becomes very important to their success.

How have you seen virtualization changing what organizations need to do in terms of management, both from a technical and organizational perspective?

SC Whenever you abstract out, whether it's the compute infrastructure, the storage infrastructure or the network infrastructure, you create visibility holes. When you have these holes, whenever you have performance issues it becomes increasingly difficult to troubleshoot and solve those issues just by looking at any given silo within the IT environment.

It becomes very hard for someone looking at just the compute infrastructure to say: "I know how to solve that problem". Because once they've abstracted, there's an element of network in there and there are clearly elements of storage in there. So the technical abstraction is creating the need for much more organizational collaboration.

At SolarWinds, we've talked about breaking down the silos, if you will, between compute, network and storage. I think some organizations are starting to break down the organizational silos. But even before you do this, the people in each of these domains have to talk to their peers and collaborate with them around not only solving problems when things are actually broken, but even optimizing performance before things are broken.

The biggest change that's been driven out of virtualization in management is the collapse of the silos, first technically, and then ultimately, I believe it will ripple through the final organizational perspective as well.

"... the challenge around virtualization is maintaining a level of visibility..."

BG You alluded to concepts that have been around in network management for a very long time, looking both at proactive management as well as reactive management.

What we're seeing now is that the IT pros who are dealing with virtualization are starting to look at network management and virtualization management as merging together, and adding both proactive and reactive management of the overall virtual infrastructure.

As you said, crossing the silos so that tools can start to do both proactive and reactive management across all the silos helps the organization to better manage the overall infrastructure, providing better service delivery, more responsiveness and so on.

SC That's absolutely right. We see that performance monitoring of the virtual environment is becoming more and more important. We're on the maturity and adoption curve, moving to a place where people have gone beyond the low hanging fruit and they're trying to get more out of their virtual environment.

As soon as you start to push the environments that way, you start to create issues for yourself, and you start to have to optimize performance.

People are even starting to move to a place where they're asking about virtualizing more of their applications. Those that are performance-sensitive are being virtualized and so they have to look deeper at just how the virtual environments are operating and what the dependencies are in order to get to the next step of maturity—and to take advantage of the efficiencies that the virtualization components offer.

Whether its cost savings or increased utilization of the assets you have, getting to the next level is going to take a real focus on performance.

BG Absolutely. And we've seen such tremendous success with organizations virtualizing the first 25% of their servers, and now expanding to get those same kinds of benefits from the next tier of applications. That starts to move them into more production-oriented and performance-sensitive kinds of applications.

In fact, we did a recent FOCUS research study of advanced virtualization management shops and we saw that implementing performance, storage and capacity management are some of the top priorities in terms of virtualization management efforts.

Storage challenges and difficulty troubleshooting performance problems also come in very high in terms of virtualization implementation pain points.

Often what we see is that, as users try to expand their virtualization, their efforts tend to stall as they look to virtualize performance-sensitive applications because they start to run into these kinds of pain points.

Are you seeing that as well? What do you suggest IT managers do to help mitigate those pain points and be able to make that leap to the next level?

SC You mentioned storage—I think storage is the first wall you hit as you start to drive the adoption of virtualization. In your first 25%, the storage I/O problems are there but you've got enough capacity to address them.

As we go past that first 25%, we're really running into two problems with storage—one is I/O bottlenecks which are impacting performance, and the other is virtualization sprawl, which is driving more and more storage consumption.

To address that—and it's one of the reasons that we actually decided to enter the storage management market—you need a good storage resource management solution in place that is very virtualization-aware.

Let me tell you what I mean by that. First of all, I think any storage resource management solution should give you multi-vendor support so you can get visibility into how your storage is being used, and forecast and trend where that's going.

On the virtualization sprawl side, you will start to see your storage getting consumed and you can begin looking for ways to get some of that back.

But on the I/O bottleneck side, the traditional storage solutions don't really give you anything. They could tell you about whether the overall I/O on an array was being consumed, but they weren't really going to break it down.

What we're seeing is that, when you have the ability to go all the way from a VM, map that into your physical storage infrastructure and identify where the conflicts are, then you're able to start making decisions around how you should assign your VMs to your storage environment, how to optimize and identify where the bottlenecks are, and then move those storage elements or VMs around.

A lot of people say they prefer our storage solution because they're able to go all the way from a VM to a physical disc, and now they're able to identify where there are performance issues and address them, proactively, before they become real problems.

BG Virtualization has been a tremendous enabler and cost-saving mechanism in IT organizations, but as virtualization progresses and as hypervisors become more efficient, organizations want to increase their consolidation ratio.

For example, if you look at some of the changes in the latest release of vSphere, I/O handling within the hypervisor architecture offers significant improvements in consolidation ratios.

That's great in terms of reducing the TCO on the server side, but the more you consolidate and the more VMs you run on an individual physical server, the more you increase the storage and I/O bottlenecks.

It becomes more important to have the right workloads, placed in the right places and with the right paths through the right kinds of storage networking connections—and the right storage devices.

So the kinds of things that you're talking about become more and more important as virtualization advances across the infrastructure and gets better in terms of performance.

SC That's absolutely right. And vSphere has done some great things to improve the I/O performance at the hypervisor layer. But that sort of moves the I/O bottleneck to other places in the system.

As we continue to mature in our adoption of virtualization we're going to see technologies that need to be able to identify where those bottlenecks are. Because we're not talking about a static environment anymore, we're going to have to see where bottlenecks are being created and deal with them before they really become problems.

That is truly one of the performance challenges that folks who are taking the next step in virtualization adoption need to deal with. We've talked about server loads, but I think in many ways there are analogous problems as people even do things like desktop virtualization.

“... anxiety about having no visibility to a virtual switch is based on some real concerns about how security is going to work in those virtual environments...”

BG Let me go back for a second, because you folks did an acquisition in the storage management space recently. Can you talk about that and the role that you see yourselves playing, relative to network and storage management?

SC The acquisition was a company called Tek-Tools, which had storage and virtualization management products, currently called the SolarWinds Profiler family.

If you look at our Orion product family, we cover network, and within our networking products we actually have modules for application management and have the ability to monitor virtual environments, both hosts and servers.

As we talk to our customers, the problems of storage I/O were becoming increasingly clear, which is why we set out to do the acquisition. As we move forward, the two product lines are being integrated so that customers can have a single view across network, systems and storage, as well as a view of application performance.

Ultimately, that's what people are really interested in—the performance of the application. Our goal is to have a robust end-to-end management solution that people can look at and see everything that's going on, whether it's physical or virtual, and deal with the performance of their IT environment holistically.

BG So many of the management products that have started to emerge in the virtualization space have been very specific point products that came from new virtualization startups.

You come at it from a different perspective having been in the network management business for 10 years, and you understand what it takes to do network management for production apps. Now you're seeing the impact that virtualization is having on the network for your customers.

Can you talk about how that is affecting your customers, what they're asking for, and how they're using their tools differently? How do you see that evolving?

SC First of all, I think the impact on the network is probably one step behind the impact on the storage. That was more acutely felt, right out of the gate.

We're starting to see now on the network side that, as people change the workloads that they're putting into their virtual environment and as they look to leverage technology like live migrations, you start to have to account for network and the network load that's connected to that workload.

You've got to understand what your network resource is and what's available before you start moving things around as part of that decision-making process.

Another thing we're seeing comes down to a problem with visibility. Last year, I was talking to a company where the network engineer said; “There's now a piece of network infrastructure in the virtual environment called a virtual switch, and I need to know how I'm going to manage that because I'm not turning over management of something that's so integral to the network to the server administrators. So how do I manage a virtual switch within the context of a virtual environment?”

This anxiety about having no visibility to a virtual switch is based on some real concerns about how security is going to work in those virtual environments; how configuration is going to work; how they're going to see the bandwidth being consumed, and how they're going to see what the upstream bandwidth implications are.

People are leveraging NetFlow with things like the Cisco Nexus 1000V, which is a virtual switch. We're seeing people looking at how they're going to do things like IP address management and network config management in the context of virtualization.

So these are some of the elements that are cropping up, and as we start to see greater adoption of virtualization and much higher densities on hosts, it's something that everyone is going to be dealing with and it's going to become a more acute problem.

The moment you step into high adoption of things like FCoE, I think that problem is going to go up dramatically. Because today, the network is only being used to move the compute loads around and deal with data traffic that's tied to a particular workload. As soon as it is the conduit to storage as well, and you move away from traditional fibre channel, that is only going to increase the focus on network monitoring within virtualization.

BG In the past, storage and networking have been somewhat like second class citizens in the virtual infrastructure environments from VMware's perspective.

With enhancements like VN-Link, the Nexus 1000V, the changes in the way virtual switches are managed, giving management back to

the network staff, and with enhancements like the vStorage API for data protection (VADP) and array integration (VAAI), VMware is addressing the importance that both networking and storage play within the virtual environment—and the importance of management of both of those into the success of virtualization.

As we move into performance-sensitive applications, there's also the requirement to better manage those, keep performance up, be able to guarantee service levels and so on.

Earlier, you mentioned desktop virtualization. There's a huge impact on the network when you take something that used to have no networking between the keyboard, the monitor and the desktop, and move the desktop to a virtual desktop on the back of the infrastructure. What do you suggest users do to prepare for that impact?

SC We're definitely starting to see people dealing with that challenge. It's always been one of these things where people in general felt they had adequate network capacity to deal with the users, the desktop or laptops floating around the office, on the LAN.

With VDI you're getting into a place where people realize that they have to start planning for peak load. Everyone comes in between 8-9am, so what happens to the network responsiveness during that time?

I don't know that people have a great solution mapped out altogether, but I think they're probably starting with the traditional approach which is understanding how much capacity is being utilized and then building some policies around prioritizing some of that traffic—whether it's time-of-day prioritizations or general prioritizations of VDI traffic.

This is happening because the early adopters are running into some of those issues and trying to figure out how to address them. So they're looking at their network management tools and getting perspective on what is being consumed using technologies like NetFlow, and then starting to build prioritization policies on the network to ensure that other critical traffic isn't impacted during that time.

What they haven't done is take a step towards optimization of the existing asset, or looked at what's happening to the end user experience when they have to prioritize traffic. That's a level of evolution that I think will occur over time, but I don't think we're quite there yet.

BG Yes, we've found that acceptance of change in the way we deliver desktops, and the number one factor in the success of a proof of concept on desktop virtualization, is end user experience.

Moving on, as you see customers virtualizing more of their environment, what are the common mistakes that you've seen, and what are some of the best ways to prevent those mistakes?

SC I'll go back to the point I made right at the beginning of the podcast—virtualization creates abstraction, which in turn means that companies and IT folks lose visibility into their environment. The single biggest mistake people make is not proactively thinking about what they're going to lose in visibility and how they're going to address that as they drive virtualization adoption.

People come to us after they've done a bit of virtualization and didn't think about the visibility problem. They didn't think about what that means to addressing problems, understanding the performance of their applications, and what the workloads were going to be once they virtualized.

It's interesting to see that happen because a lot of times people will start by monitoring the virtual servers, just as if they were physical servers. So they'll look at CPU, memory consumption and things like that, but they don't have visibility into the dependencies. Obviously, as soon as you have multiple workloads on one host you've got dependencies between those workloads.

That's where folks like us come in, because our goal is to provide one solution that allows you to look at the things that are the same consistently. There's no reason why you shouldn't look at an interface

on a network, whether it's virtual or physical, and look at things like utilization, but that also gives you the visibility into shared resources.

I think that appreciating the fact that there is going to be a loss of visibility and proactively looking at the tools that you can bring to bear, whether they're existing management tools or new ones that you put in place, is key.

From a management tool perspective, having two ways to solve the exact same problem—physical and virtual—probably doesn't make a lot of sense to IT operations organizations.

The fact that virtualization has created a whole new set of management tools doesn't change the fact that these are going to be the problems that you solve every day and they should be solved with one management system, whether it's physical or virtual.

There are new problems that virtualization has created, such as capacity planning within virtual environments, that do lend themselves to new products because you probably weren't doing that type of capacity planning in your physical environment, the same way as you're going to need to do it in your virtual environment.

So there are products that are beneficial in solving some of those new problems that can be thought of as separate. That's the way that we've approached thinking about where virtualization fits in, in our management tools.

It's an approach that customers have received very well because they're used to doing certain things with physical devices, and they want to do the same things with virtual devices. Then there are new things they will have to do, and they're very receptive to new products and approaches to solving new problems.

If I was in a customer's shoes, that's how I'd approach building some visibility into my management strategy as I'm adopting virtualization.

BG I think that's a great way to look at it. One of the ways that we find helpful to users who are newer to this whole arena is to talk about some real world situations.

You've got thousands of customers out there—can you pick a situation or two where a customer was experiencing a real problem and, through the use of better management tools granting that type of visibility that you talked about, they found a better way to handle that problem?

SC I'll tell you about a class of problems that I touched on earlier. We've spent a lot of time talking about storage, and this class of problem occurs on the storage side with virtualization all the time.

You look at a virtual environment, you put a new workload on a host, you're not seeing the performance you want out of it and, worse yet, you see poor performance across the other workloads on the host.

You're scratching your head wondering where the problem is. I mentioned that we have the capability to do end-to-end mapping, from VM down to disc, and a lot of times we see customers who haven't really thought through how storage is impacting on the performance of these virtual environments, and this becomes the root cause of a lot of performance problems.

The place we're able to help them is, once they implement the profile suite, they are able to see the performance of the VMs, the storage, and see if there are aggregate problems in either of them.

When customers see that, it is amazing to them. They are able to quickly see that it doesn't make sense for four workloads to use one disc, for example. They can do something about that and move some of those workloads, and all of a sudden performance problems start to go away.

I think we're at a point in the adoption of virtualization where we've been able to help people really drill down and solve their problems.

BG Those are exactly the kinds of tools we talked about earlier as users are trying to move from that initial easy 25% virtualized to that next level of more business-critical applications. Trying to do that without tools like this is virtually impossible.

So I think that's a critical factor for the successful expansion of virtualization and ultimately private cloud computing, as well as public cloud computing.

SC That's right. We do a lot of training and education with customers and the thing that I see over and over again is that people struggle with their existing management tools. They struggle to apply it to the problems they're having today, and the thing we always try to get across is that there are different problems to solve and different ways to do it.

People should be open to looking at some of these new approaches because, as they take on new approaches to infrastructure like virtualization or private/public cloud, they're going to have to take on new approaches to management.

BG So if we can take the lessons that we've learned over the past several decades—the importance of management, successfully running production data centers, the changes in moving to the virtual infrastructure and the need to apply those management disciplines and capabilities to this new virtual infrastructure—and have the tools and the organizational changes to address those, then I think organizations will be successful as they move to private cloud and deliver these kinds of virtually-enabled cloud-like solutions out to their communities.

Are there any closing remarks you'd like to share?

SC The one thing I will say is that I think virtualization has definitely changed the game for IT. I think we're at the beginning of that journey, probably not the end.

I'll reiterate what I said at the beginning. To me, the challenge around virtualization is maintaining a level of visibility, because keeping that visibility is going to help people deal with the complexity that virtualization brings.

It is a new way of sharing resources and driving up utilization of our IT infrastructures, but it has made everything so interconnected that visibility not shared among an IT operations group, across all the different silos, is probably a recipe for disaster on the front of IT organizations.

I would encourage anyone who's thinking about taking the next step in virtualization to pause and think about their management strategies before they take the dive. ■

IT Management Inspired by You.

SolarWinds (NYSE: SWI) provides powerful and affordable IT management software to more than 95,000 customers worldwide — from Fortune 500 enterprises to small businesses. We work to put our users first and remove the obstacles that have become “status quo” in traditional enterprise software. SolarWinds products are downloadable, easy to use and maintain, and provide the power, scale, and flexibility needed to address users’ management priorities. Our online user community, thwack, is a gathering-place where tens of thousands of IT pros solve problems, share technology, and participate in product development for all of SolarWinds’ products.

solarwinds.com



3711 S. MoPac Expressway, Building Two, Austin, TX 78746
T: 866.530.8100 | F: 512.682.9301

©2010 SolarWinds, Inc. All rights reserved. SolarWinds®, the SolarWinds logo, ipMonitor®, LANsurveyor®, and Orion® are among the trademarks or registered trademarks of the company in the United States and/or other countries. All other trademarks are property of their respective owners.