

How to Select a Virtualization Management Tool

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INTRODUCTION

While VMware provides an excellent management tool for your virtual infrastructure in vCenter Server, most VMware admins soon realize that they need to expand their toolset to include resource monitoring, performance analytics, and capacity optimization capabilities such as those found in VMware's vRealize Operations offering. Let's assume that you have decided to consider something more than vCenter Server to manage your growing virtual infrastructure. With so many tools available from VMware and other vendors, how do you tell them apart? How would you narrow down the masses of tools into just a few, to test? And how would you select a single tool to recommend your company purchase? As a former IT Manager who has been through this process several times, I can tell you from firsthand experience, if you want to do a thorough job of this, it's not easy and it can consume a lot of time. Sure, you could easily select a tool based on superficial reasons such as the charm of the salesperson or that they had a great ad in a magazine, but really comparing them, testing them, and choosing one based on quantitative reasons is tough as not only do you have to find the similarities and differences but also where tools "are the same but different". For example, many tools may claim to do "capacity planning" for the virtual infrastructure but "how" do they do it exactly and which approach is the better approach? You can't make an accurate comparison with only a high-level, superficial, check-box matrix.

DIFFERENTIATING VIRTUALIZATION MANAGEMENT TOOLS

On the surface, all virtualization management tools might look alike. You can walk around the expo at your local VMware User Group Meeting (VMUG) and probably find at least 5 different virtualization management tools. At VMworld you might find 20+. Over the years, I've come up with a few questions that I ask which allow me to quickly tell them apart. While you are free to come up with your own questions, here's what I recommend that you ask...

WHAT'S THE HISTORY?

One of the first questions that I ask product managers and engineers (not always salespeople because they too-often don't know) is about the history and the architecture of the tool. Where did the code for this tool come from? Is it the same tool that I used 10 years ago and it has been "retooled" and "face lifted"? Did the tool used to be an "SNMP element manager"? Many times, this history will "connect dots" for you and you might remember this tool from the past. If nothing else, this knowledge will give you insight into who created the tool, how old it is (which will determine its architecture and whether it was designed for virtualization or physical servers), and what company it came from.

WHAT'S THE ARCHITECTURE AND DESIGN?

For the most part, virtualization admins aren't developers and, in most cases, they don't think about a tool's architecture until they have already bought it. However, you don't have to be a software developer to know that the architecture of a tool is what defines its complexity, scalability, and limitations. For example, if a tool requires that you supply a database connection, you will obviously have to pay for, manage, and monitor utilization of that database over time. Another example might be, how is the tool designed to obtain its data? Is it agent-less, agent based, or does it allow you to use both? Agent-less designs are great but there are limitations to what they can provide.

Agent-based designs can provide a lot of insight but they also, require you to deploy agents on every monitored host (unnecessarily in many cases). On the other hand, some tools give you the option to use the agent-less approach until you need deeper knowledge, at which time you can install agents.

Another example of how the architecture and design of a management solution is important is how it affects the openness of the solution. Some solutions are designed in such a way that they can be easily extended and integrated with other solutions in the datacenter whereas closed solutions are designed such that they can only be enhanced by the software vendor who created the solution.

WHAT'S THE ENTRY LEVEL PRICE POINT AND PRICING MODEL?

At many companies (especially the small and medium-size private companies like I came from) the cost of the tool is made to be the primary deciding factor in tool selection. For example, at my previous company, I had a mythical “line in the sand” at \$100,000 for any hardware or software. If any single solution cost more than \$100K I would either tell the vendor “forget it” or “break it into smaller chunks” because I knew that my company’s owner would laugh at anything that expensive or it would require a massive multi-year campaign to get approved. Thus, I personally always preferred tools that were full-featured but priced in smaller more affordable chunks like “per VM”.

While in some cases the “per VM” model might cost more than the “per socket” model, with “per VM” you might be able to select just the VMs you want to monitor instead of being required to purchase a solution to monitor all servers. Your company, on the other hand, might look at the total 5 year cost for the entire virtual infrastructure and, in that case, the “per socket” cost might be more appealing.

In addition to deciding per VM or per CPU, a new consideration these days is workloads moving to public cloud. You may not know upfront how many workloads will be on-site in your datacenter and how many in the cloud. So licensing flexibility, where you can convert a license from on-site workloads to public cloud workloads, becomes critical.

However, the most important point about cost is – **don’t get stuck on cost**. In other words, don’t rule out the really excellent solutions just because they “cost more”. In many cases, it is worth it to “pay a little more to get a lot more” such as a tool that is easier to use, more full featured, or more extensible. Also, it’s better to buy the “right tool” the first time instead of growing out of it and having to “pay double” by buying another tool when the first tool doesn’t work as expected.

WHAT DOES THE TOOL DO FOR YOU?

Tool vendors should be able to quickly give you 3-5 bullet points covering what the tool does and how it helps you. When you ask this question, you shouldn’t receive a 10-minute speech. The “UVP” (or unique value proposition) is something that any company should be able to quickly answer.

Tools in the virtualization management category typically provide features around:

- **Comprehensive monitoring and alerting** – monitoring the most critical resources of the virtual infrastructure – **compute, memory, storage, and networking** - and then alerting on the status of any of those resources. For example, alerting that a vSphere host is experiencing an “all paths down” storage event or that a vSphere host is unreachable on the network. Notifications to the administrators should be able to be done in a variety of ways.
- **Change tracking** – tracking changes to the infrastructure in order to be able to quickly identify and rollback those configuration changes if the changes are found to be the root cause of a problem.
- **Performance analysis** – analyzing resource utilization across datacenters, clusters, hosts, virtual machines, data stores, and networks in order to quickly identify (and perhaps even prevent) performance bottlenecks that cause application slowness or outage.
- **Capacity optimization and planning** – analyzing long term capacity utilization in the datacenter in order to determine when additional resources will be needed or where unused resources are sitting idle.

- **Performance and capacity alerting** – similar to general monitoring and alerting, performance and capacity alerting can alert administrators, for example, that a host is hitting higher than 80% CPU utilization or that a host is paging to disk because it's out of physical memory.
- **Performance and capacity troubleshooting** – help you in identifying the root cause of performance issues when they occur, for example, identifying storage I/O contention on a host as the root cause of application slowness on a specific virtual machine.
- **Log Analytics** – using log data from a variety of sources to quickly identify the root cause of a problem.

Some examples of additional functionality that takes these capabilities further are:

- **What-if scenario analysis** - answering questions like “if I doubled the memory on all hosts in a cluster, how many more VMs would I be able to add and what would the next bottleneck be?”
- **Application analysis** - integrating metrics from applications such as “database I/O latency” or “transactions per second” with traditional performance metrics.
- **Workload balancing** – ensuring that virtual machines (and their critical applications) get the resources that they need to perform well both within a cluster (like with vSphere’s distributed resource scheduler, or DRS) as well as across multiple clusters.

- **Automation** – once you are comfortable with recommendations from the tool, being able to automatically turn those recommendations into actions and remediate issues in order to always ensure application performance. For example, if a VM needs more vRAM it could be dynamically added or if a change caused a performance issue then the tool could reverse the change.
- **Relationship mapping** – being able to visually see the relationships between objects and resources, not just up and down the stack (from the application, through the virtual infrastructure and down to the physical hardware) but also between multiple virtual machines that make up complex multi-tiered applications.
- **Cost insights** – being able to know what the cost of various infrastructure components are such as CPU, memory, storage etc. so you can optimize utilization better.

HOW DOES THE TOOL SHOW MEASURABLE VALUE?

Once you know where a tool came from, how it collects its data, and where it's stored, you want to know how that tool is really going to help you. After all, it's one thing for a tool to do "performance monitoring" but, if that just means it offers some pretty speedometer dials with CPU and RAM, that isn't very helpful in the grand-scene of virtualization management. Make sure that the value the tool provides is quantitative. For example, a tool that "reduces the time that it takes to troubleshoot problems on average by 50%" is far better than a tool that just "improves efficiency".

Another question to ask around measurable value might be "how does your tool intelligently identify problems and then help to prevent them or quickly solve them?" For example, vCenter Server offers simple thresholds that can be configured (i.e.: when a host has > 80% CPU utilization) to point out potential trouble in the virtual infrastructure

By comparison, smart management tools use more than just thresholds. Smart tools should monitor your typical utilization, over time, learn about what is "normal" for your environment (think "baseline") and then detect anomalies. In other words, the tool must know "what's normal vs. abnormal" (just like you do) and then either take action or help you to intelligently and efficiently take action to solve that problem.

Once the tool is able to identify problems, provide trusted results, and help you to quickly solve that problem, you can move on to making the rest of your infrastructure more efficient.

WHAT TYPE OF INTEGRATION AND EXTENSIBILITY IS INCLUDED?

Many tools only see the virtual infrastructure and many of those tools pride themselves on that fact. While that is, of course, important, the reality is that there is more to the datacenter. Tools should be able to monitor your physical servers, storage, networking, applications, public clouds or just about anything you want them to. This “extensibility” of a tool gives you great flexibility as a virtualization admin. Ask yourself: can the tool monitor my Amazon Web Services instances, Oracle database, Hyper-V server, Exchange infrastructure, Windows OS, and storage array? And even if they can, just showing you data from those sources on the monitoring interface in a single window (providing a “single pane of glass”) isn’t enough.

Why not use the data collected from these numerous other sources, bring it into your monitoring database, and be able to correlate it with virtual infrastructure statistics? You are investing in the smartest performance and capacity analysis tool you can find, right? Why not use that investment to analyze other datacenter resources?

WHAT'S THE LEARNING CURVE?

All too often, ease of installation and the usability of a tool is overlooked. If you can't deploy the application and realize its value in under 10 minutes, then the tool is too complex. Another factor in usability is the user interface. Virtualization admins deserve beautiful, easy to use, fast, intuitive, and even (dare we say) FUN-to-use tools. *Don't settle for less.*

WHAT'S THE FUTURE OF THE TOOL?

Once you know where the tool is at today, you should ask "where is the tool going". What are some of the most requested features? What is planned for the next release? What are the major features you foresee adding in the next 1-2 years? What has been the cadence of releases and new features in the past? Virtualization management tool developers should be candid with their end users and be able to answer these types of questions. Surely you have a grand vision for your future career success, right? Similarly, if the tool vendor can't offer you a "plan for the future" (roadmap) of their tool, then look elsewhere. You want a tool that will be around and will continue to offer greater and greater value for you and your company.

WHAT'S THE ONE THING THAT MAKES IT UNIQUE?

Out of every tool, try to find and remember one thing that makes a tool unique. In the case of the vRealize Suite, which includes vRealize Operations and vRealize Log Insight, I remember that “it’s from VMware” since I know it is designed to work with what I already have. For other companies it might be “legacy element manager tool with a pretty face” or “strong on virtual network analysis in VDI”, or similar.

SELECTING THE RIGHT TOOL FOR YOU

Using the questions above, you should be able to narrow the field of roughly 20 tools down to 2-3. From there, you should put those tools to the test in your lab environment. This is important because you need first-hand experience with these. For example, you can get an idea of the usability of a tool in a quick demo or video however to really see how usable a tool is, you’ll need to install it and spend some time clicking around, right? This is also true for showing measurable value. You should be able to do a short proof of concept with a tool, using it to monitor (in a read-only mode) your production virtual infrastructure. If it doesn’t show you real value in a reasonable period of time, then move on to another tool.

APPENDIX: WORKSHEET FOR CHOOSING A VIRTUALIZATION MANAGEMENT SOLUTION

Here's a list of questions to ask tool vendors when shopping for new tools. Note that this isn't called a "checklist" for good reason. Checkbox-style questions don't go into enough detail about "how" and "why". Instead, note the answers to these more complex questions on a worksheet with multiple bullets as the answer to each question.

	Vendor #1	Vendor #2
History		
Architecture		
Entry-level price		
Pricing Model		
Total cost of ownership (TCO)		
What the tool provides / benefits		
How they show measurable value		
Integration / extensibility		
Usability / learning curve		
Future direction		
What makes the tool unique		
Eval / PoC status		
Summary / conclusion		

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With over 20 years in enterprise technology, David Davis has served as an IT Manager where he implemented and administered VMware solutions. He's authored hundreds of papers, eBooks, and video training courses – especially around virtualization and cloud computing. He's a 7 x vExpert, VCP, VCAP, & CCIE# 9369. Today, he is a partner at [ActualTechMedia](#) where he creates content around enterprise technology, and moderates online events. His blog can be found at [ActualTech.io](#) and his video training is available at [Pluralsight](#). You can find him on Twitter at [@DavidMDavis](#).