



## Top 10 Virtualization Myths

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Ongoing discussion in the Blogosphere

In the name of tongue-in-cheek humor, here is a count down of the top 10, oops, top 11 virtualization myths. This list comes from messages I've received from Kusnetzky Group clients, readers of my ZDnet blog and from comments addressed to other virtualization technology Bloggers. Please let me know if you'd got a myth to add to this ever-growing list.

### 11) VIRTUALIZATION IS AN IMPORTANT PART OF SERVICE ORIENTED ARCHITECTURE APPLICATIONS

I've often heard suppliers of virtual machine software point out that an SOA application is a good prospect for encapsulation in number virtual machines. The supplier suggests that each of the application services could be encapsulated into virtual machines. These virtual machines could then be hosted on one or many machines depending upon the needs of the organization.

Depending upon the configuration of the host physical machine, the communications architecture and the design of the application, organizations just might gain the benefit of significant performance degradation when they introduce virtual machine technology into the application environment.

Since applications inside of virtual machines are isolated form one another, an SOA application that depended upon memory-to-memory communications architectures may not work at all.

Organizations would be wise to use different virtualization technology, such as clustering, workload managers or application virtualization rather than virtual machine software for SOA applications.

### 10) VIRTUAL MACHINE SOFTWARE CREATES MORE HIGHLY AVAILABLE AND RELIABLE ENVIRONMENTS

Suppliers of virtual machine software often tout the improvements in reliability and availability gained through the use of virtual machine software. They would point out that applications or application components can be easily restarted in case of an outage. What they don't say is that if the organization puts all of these virtual machines onto a single physical machine, they've introduced a single point of failure, i.e., all of the organization's eggs are in one basket.

If the organization adopts an orchestration manager along with virtual machine software, has several physical machines, virtual network connectivity and virtual storage, this myth might actually be true. Without those things, however, virtual machine software is likely to actually reduce the overall reliability and availability of the environment.

#### 9) VIRTUAL MACHINE SOFTWARE CREATES A MORE SECURE ENVIRONMENT

Proponents of virtual machine software often point to the improved security posture of organizations using virtual machine software. They would point out that if the security of a single virtual machine is breached, that it would be easy to stop it and reload it from a safe repository.

Software encapsulated into a virtual machine still face many, if not all, of the challenges that software hosted on a physical machine face. Operational errors, such as loading an infected file, might introduce worms or viruses into the organization's IT infrastructure.

While these statements are true, organizations are going to find it very difficult to assess what damage had already been done in the environment in the case of a security breach. Errant virtual machines could easily have compromised shared data, damaged host machine configuration files or modified dormant virtual machine images before the breach could be discovered.

Virtual machine software adds a layer of technology that may not be secure itself. Several suppliers have recently introduced software designed to address this concern but, their products are still in the early-adopter stage.

#### 8) VIRTUAL MACHINE SOFTWARE THE RIGHT ANSWER FOR EVERY ENVIRONMENT

The Kusnetzky Group's research indicates each layer of virtualization technology offers benefits when used correctly and when the right goal is in mind. No virtualization technology does everything, for everyone, everywhere. Why, then, do organizations choose to go to the time and trouble to adopt some form of virtualization technology and what virtualization technology would they adopt? Here are some typical goals and what virtualization technology should be considered.

- ☒ **Availability or reliability** – several different layers of virtualization technology are often deployed in the attempt to achieve the goal of making outages, planned or unplanned, invisible to users. The list usually includes access virtualization, application virtualization, processing virtualization, network virtualization, storage virtualization and tools to manage a virtualized environment. Virtual machine software, all by itself, can not achieve this goal.
- ☒ **Consolidation** – virtual machine software and operating system virtualization technology can both help organizations increase the utilization of physical resources by consolidating functions onto a smaller number of systems. Organizations would also need to deploy a number of other layers of virtualization technology to really gain all of the benefits mentioned by suppliers of virtual machine technology including network virtualization, storage virtualization and tools to manage virtualized resources. Without all of these other tools, the organization would soon find that they had a patchwork quilt of systems that were difficult and costly to use.
- ☒ **Performance** – since virtual machine software and operating system virtualization technology are focused on allowing multiple functions to share the same physical resources, organizations are very likely to select different virtualization technology if their goal was to increase the performance of a single application. Application virtualization, Grid computing monitors and clustering software are the most apt choices if the goal is higher levels of application performance.

- ☒ **Scalability** - those needing to support a high volume of business transactions are also not going to be best served if they select either virtual machine software or operating system virtualization technology. Obtaining the maximum in scalability often means spreading a single workload over many physical machines. So, application virtualization, workload management software combined with a clustering monitor would be the best choice here.
- ☒ **Unified Management** – if the goal is establishing a single management domain is the goal, virtual machine software may or may not help. Often the users of virtual machine technology move from facing a physical machine sprawl in their datacenter to facing a virtual machine sprawl. Management tools that allow a unified management of hybrid environments that include mainframes, midrange machines, industry standard systems and both physical and virtual resources are really needed to achieve this goal.

There are many different layers of virtualization in use today. Organizations must take a broad view to obtain the greatest benefits.

#### 7) MY ORGANIZATION IS READY

Often organizations believe that they are ready to deploy virtual machine software without much planning. In the experience of the Kusnetzky Group, some of these organizations ultimately face significant challenges because they are mistaken. If they had taken the time to address the following issues, they would have had a far more successful deployment of the technology.

- ☒ Management team organization — does the organization have a unified management team or are there separate groups that manage application development, system infrastructure, network infrastructure, web infrastructure and virtualization technology. Fragmented management makes implementation of virtualization technology more difficult.
- ☒ Development team organization – does the organization have a unified development team or are there separate groups that develop mainframe applications, midrange applications, Windows applications, Linux applications, Web-based applications, etc. Fragmented development makes the deployment of virtualization technology less efficient.
- ☒ Process issues – most environments are hybrids of physical and virtual resources. Does the organization have the tools to discover and manage all IT assets? The next serious issue is determining who is responsible for operations and administration of each of these resources.

#### 6) NO SPECIAL EXPERTISE IS NECESSARY

Some suppliers of virtual machine technology are downplaying the impact their technology has on application performance. Adding another layer of software or migrating many applications from their own separate machines to a single larger server is likely to have an impact regardless of what they're saying.

Let's look at each type of virtual processing software and consider what impact that layer's likely to have on application performance

- ☒ Grid computing monitors, high performance computing monitors - Applications that have been properly decomposed into separate functions or whose data has been segmented into components so that an "application" can be spread over several machines are likely to see performance increases over running those same applications on a single machine. The goal in using this software is usually to accelerate the performance of a single or small number of applications.

- Single-system-image clustering monitors - applications are likely to remain on a single system until there's a failure. Since the clustering monitor consumes some of the system's time and the goal of using this technology is creating a unified management and execution domain rather than increasing the performance of any one application, performance degradation is expected.
- High availability/failover clustering monitors - as with single-system-image clusters, applications are likely to remain on a single system until a failure occurs. Performance degradation is likely to occur, but to a smaller degree than with a single-system-image clustering product. Why? HA monitors are doing less than a single-system image clustering monitor and so consume less processing power.
- Workload management monitor - multiple instances of applications are likely to be running on different machines in the cluster. So, more people will be able to access the applications but, each instance is likely to see a reduction in performance because it's sharing the machine with the workload management product and other applications. The goal here is usually scalability not performance.
- Virtual machine software - multiple applications, each with its own operating system, are being hosted on a single machine. The goal here is consolidation and, possibly, agility rather than application performance. Depending upon the hypervisor and the hardware capabilities of the processor, reductions in application performance are expected.
- Operating system virtualization/partitioning software - multiple applications, each in their one partition, are being hosted on a single machine. Since there is still only a single operating system in use, reductions in application performance are less severe than with virtual machine technology but, they are still expected.

Each virtual processing technology can add value to the organization's IT infrastructure. Organizations, however, must understand that each also introduces additional stress on the computing resources.

5) MY APPLICATION WILL PERFORM EXACTLY AS BEFORE

- It is likely that performance will degrade
- How much depends upon
  - Processor
  - Memory
  - Storage
  - Application
  - the rest of the environment

#### 4 ) USE OF VIRTUAL MACHINE SOFTWARE REQUIRES NO PLANNING

As Alan Laken is credited with the statement “Failing to plan is planning to fail.” While this statement seems true in most areas of life, it really has an impact in the deployment of virtual machine software on both client and server systems. This goes against the strongly held belief in some quarters that there is no need to plan virtual machine deployments.

Since it's fairly easy to create a virtual machine, provision it with software, deploy it and when there's no need for its further existence, destroy it, why would anyone take on the burden of a formal process?

Why, then, do we hear of the following issues?

- Virtual machine sprawl replacing physical machine sprawl.
- Organizations having difficulty managing hybrid (physical plus virtual) systems
- Software license management in a hybrid datacenter
- Network management in a hybrid datacenter
- Storage management in a hybrid datacenter

If an organization takes the time to plan, all of these issues can be addressed with technology that's available today. If an organization allows the relative ease of deployment of virtual resources to override common sense, they're likely to end up with a patchwork quilt of products, tools and virtual resources that's hard to administer or operate.

#### 3 ) VIRTUAL MACHINE SOFTWARE REDUCES COMPLEXITY

When I've had a chance to speak with executives of suppliers of virtual machine software, they often point out that one of the major benefits of deploying application environments inside of virtual machines is simplicity. That is, they suggest that using virtual machine software reduces complexity in the environment.

While that might be true from the perspective of that single application, it may not be true of the whole environment. Installation, migration from one physical machine to another and even some application management tasks can be facilitated by the use of virtual machine technology.

Installation may change from an arduous task to merely copying a file. Migration of an application environment from one physical system to another also becomes a file transfer.

From a broader perspective, however, virtual machine technology is another layer of technology, one that requires expertise. The fact that virtual machines running different application environments, different operating systems, etc. can all share a single physical machine may require more expertise than managing a single operating system, application, etc. on a single physical system. Organizations may find that more types of expertise are needed than before.

In a purely physical environment, one could walk through the datacenter and see all of the machines. In a consolidated datacenter where many virtual systems are supported by a small number of physical systems, all of the systems in use may be hard to find without the help of some sophisticated management software. New virtual resources can pop up in moments and disappear just as quickly.

As with other types of marketing hype, the statement that virtual machine software always reduces complexity needs to be examined closely. It may

reduce complexity in one area of datacenter operations while imposing new types of complexity in others.

## 2 ) ALWAYS SAVE MONEY

One of the key messages most suppliers of any virtualization technology use is that the use of their product will automatically save the customer money. I have concerns that some of them are really over reaching to convince customers. Do you agree?

If I follow their line of thinking correctly, some of what they're saying can certainly be supported by cost of ownership or return on investment studies that have been published. Most of these marketing messages focus on saving staff time and thus saving money.

I believe that this is based upon North American and Western European focused studies that seem to suggest that hardware and software when combined usually make up fewer than 25% of the costs in a 5 year cost analysis. Staff-related costs typically are between 50% and 70% of the total costs in those same studies.

Some of the folks focused on virtual processing technology (grid computing software, clustering software, workload management software, virtual machine software and operating system virtualization/partitioning software) also state the customer will save money on both hardware and software.

In my time in the industry, I've learned that no single technology automatically produces savings. Even the best of technology can be used in "sub-optimal", perhaps inappropriate ways. When a technology is used improperly or is seen as a panacea that will solve all problems everywhere, there's often a cost.

## 1 ) O S I S D E A D ?

Some of the statements made at VMware's VMworld event convinced some people that operating systems are becoming an endangered species and that shortly they'll be replaced by virtual machine software. This is a very unlikely scenario and let me address the reasons why this is so:

- Hypervisors are small operating systems or components of general purpose operating systems, such as Windows, Unix or Linux. Replacing one with another doesn't mean that operating systems have gone away only that functions have been "re-hosted" to run on the hypervisor directly.
- Most applications have been written to use the facilities of an operating system and related system software. Until hypervisors offer all of those features, applications would have to be rewritten to internalize those functions. Who's going to save money doing that?
- Hardware suppliers offer support based upon a well-tested list of hardware and software options. It is not at all clear that these suppliers would support an application stack running directly on a hypervisor. This is something the organization would have to discover on a case-by-case basis.

What seems far more likely to me is that virtual machine software, and all of the other layers of virtualization technology that the Kusnetzky Group has examined will take its place in the toolkit of a developer.

When appropriate, such as when the organization wants to consolidate applications from underutilized older machines onto a smaller number of newer machines, virtual machine software or a related technology, operating system virtualization/partitioning software, will be deployed.

Other virtualization technology will be deployed if high performance, scalability, agility or a unified management environment is needed. In these cases, virtual machine software either isn't the right tool or needs help from another tool. Let's



not be overwhelmed by a single suppliers marketing hype and be driven to make short term decisions that have negative long term effects.

#### S U M M A R Y

The organizations that seem to get the most out of technology have developed an overall architecture that makes room for changes, future technology and the like. They've included thoughts about management and security in their plans. They adopt technology only when it can be made to fit in their architecture without causing disruption. If a supplier offers a technology that seems to offer benefits when taken on its own but, will cause disruption when put into the organization's network, the wise organization says "no thanks" and continues based upon their plan.