Virtualization and Virtual Machine Software. We help you to choose the best VM

Virtualization is abstracting functions or complete stacks of software away from the underlying infrastructure to increase scalability, reliability, performance, utilization, agility, manageability or just to reduce overall costs in some fashion. There are many different layers of technology required to create a completely virtualized environment including virtualizing access to storage resources, processing, application execution, user access and, of course, making sure these virtualized environments are both secure and well managed. Virtual machine software, a subject of much media attention today, is a technology usually assigned to the virtual processing layer. Virtualization is not a new technology, it's been deployed in corporate datacenters for well over 30 years.

Virtual machine software, such as that offered by IBM, Microsoft, VMware, Virtual Iron Software and Xen-Source, allows a developer to encapsulate an entire stack of software, from the operating system all the way up to the application, in a container, often called a *virtual machine*. This technology has the ability to run more than one of these virtual machines on a single computer that has sufficient processing power, memory and storage. Each of these virtual machines is isolated from all of the others insuring a strong security environment. Each has its own operating system, networking software, data management software, application framework software and application software. Each of these virtual machines is managed separately unless some very sophisticated virtual management software is deployed.

A partitioned operating system, such as Unix offered by HP, IBM and Sun as well as most Linux distributions, allows more than one data management software, application framework software and application software to be hosted on the same machine. Unlike in a virtual machine software environment, each of these partitions is being supported by a single operating system. If that operating system fails, everything running on that physical machine fails too.

Each of these tools should be in the developer's tool kit. It is possible that the use of virtual machine software will require that sufficient processing power, memory and storage be allocated for a number of operating systems to run. In exchange for this investment, the developer may run different operating systems for each task. So, a Linux virtual machine may be run to support Apache, Tomcat, and J2EE applications. Windows may be run in a different virtual machine allowing the developer to use SQLserver.

A partitioned operating system may require less memory, less processor power and less storage to do something similar. Each of the partitions must run under the same, single operating system. So, Apache, Tomcat, J2EE and some data management system can all be run in different partitions. SQLserver from Microsoft, how-

ever, can not be the data management solution. It only runs on Windows.

Virtual machine software has helped many organizations consolidate workloads from many older, slower systems onto a newer, much faster single system. This process of consolidation has lowered the organization's hardware-related costs. This approach, on the other hand, may actually increase the costs of administration unless sophisticated management software for virtualized environments is also used.

by *Dan Kusnetzky*
Principal Analyst and President of The Kusnetzky Group

Users' Opinions

Microsoft Virtual PC 2007

Currently, I use Microsoft Virtual PC 2007 and used the earlier 2004 version of the same program before. I have chosen this product because the application is easy to work with and, in my opinion, it's the most popular VM. The reason why I picked the Microsoft Virtual PC was also the fact that the program is free. I have never used any other virtual machine before.

Sometimes I have to work with old programs which doesn't work on new operating systems. This is the moment when virtual machine is very helpful. I can use some old software and don't need to install physically new operating system on my PC. Besides, I can take once created Virtual PC file with operating system and run it on any other computer with this software installed. Microsoft Virtual PC can also help with testing new operating systems without integrate of existing. Working with Virtual PC was really problems free. I didn't have any breakdowns at all.

Finally, I think Microsoft Virtual PC 2007 is a great tool to learn about new operating systems and test them without need to create a new partition etc. It also helps when we want to run some old software that is incompatible with our operating system.

Microsoft Virtual PC is a really good program and it's free. The only disadvantage is that it is dedicated to run on Microsoft operating systems only. I surely recommend Microsoft Virtual PC to everyone who starts the adventure with virtual machines. It's easy to use, not complicated and absolutely free.

Notes:

- Quality/price – 10
- Effectiveness – 9
- Final, general note – 9

by *Piotr Michałowski*
Source Ltd. www.source.com.pl

VMware EAX Server

Currently, we are using VMware EAX Server running on Dell power edge hardware for our Windows 2003 environment. We are also using VMware Workstation for test servers and workstations. We have also started using Xen for our Linux (Centos 4/5 and RHEL 4/5) servers that run our web server environment. We have chosen VMware for it was recommended to us from one of our main vendors of our storage devices and it has the best performance and maturity level in the market place. We had dabbled with Microsoft Virtual PC some time ago, but the quality and maturity level just was not there compared to VMware. When deciding which VM to buy we looked at qemu, but for the same reason as MS Virtual PC the quality and maturity level of the product was not there. VMware has been a rock solid product, on some occasions we had a need to setup a new server for emergency use (i.e. old hardware failure on a standalone server). Currently we had saved a lot of money on hardware & space. Recently we have used it to deliver our MS SMS & MIIS projects without any outlay for hardware.

The only weak points would be:

- Having to shut down all the servers running just to load a VMware patch (which isn't often).
- Some applications like MS SQL database or disk intensive programs can really effect the entire server.

We did have a few problems with the `10/100/1000` Ethernet port not running to speed which was fixed with a patch. VMware is a solid product, but depending on what you want to use it for will influence your decisions. It's great for web servers or file servers but not so good for Database or disk intensive applications. Xen is great for Linux environments, but good luck getting Win2003 running (or any other Windows OS) at the moment, it's still very young compared to VMware.

Notes:

- Quality/price – 10
- Effectiveness – 8
- Final, general note – 9

by *Mark Laffan*

VMware Version 6.0

I am using VMware Version 6.0 and used earlier version of VMware in the past I chose this product for it is easy to use, and VMware has been around for years.

I have always used some versions of VMware. I did try Microsoft Virtual PC but it do not offer Linux support. Only Microsoft OS' and OS/2 are supported as guest operating systems.

I have looked at a couple of others but none of them offer the features and support that VMware has. The ones that I have looked at include Microsoft Virtual PC, and Parallels Workstation.

It allows me to play with questionable software in a sandbox type environment. I also use the virtual machines to see how different operating systems react to an attack or a virus. And finally it gives me access to the Linux environment without having to dual boot my laptop.

The main problem that I have with my setup is that if I load too many virtual machines, my laptop will hang up. Even with 2GB of RAM the machine will hang up if I load more than 4 machines at one time. So it is really a problem with my hardware and not a VMware issue.

VMware is a great product and they even have a free version available for download. I would recommend it to anyone that wants access to multiple operating systems on the same machine.

You cannot lose by using VMware, it is reasonably priced (or use the free version), fast and easy to setup and use. They also have s great support staff if needed.

Notes:

- Quality/price – 10
- Effectiveness – 10
- Final, general note – 10

by *Steve Lape*
CISSP, CCSO

Virtualbox

I currently use Virtualbox for my home vitalization. I have several virtual machines ranging from Windows Server 2003, Windows XP, to different distros of Linux (Redhat, Ubuntu, etc.). When I am at work I use VMware ESX Server for all our virtual configuration with boxes running several different operating systems. In the past I used to use VMware, but I no longer like that way it is setup or all the annoying feedback.

As far as home goes, I choose Virtualbox because I had issues with VMware. I had a hard time installing VMware player, server and then client on my Linux machine. I wanted something to just work and that's when my friend turned me over to Virtualbox. After installing all I had to do was clear up some permissions and mount the cd rom drive and that was it. I continue to use it and I think it works great.

Like I said, I used VMware before, but I had trouble messing with it. When I did get it to work it ran a little slow and overall just frustrated me. I have considered trying VMware again just because I like it so much at work. More then likely I will just stick with Virtualbox though because there is no need to be running nor is my server worth installing ESX. I would not say that Virtualbox helps me

with my computer, but it does help me out with a lot. It is not often that I use a Windows machine as my main computer, but there have been plenty of times where I would like to test something out on one and Linux just can't do it. That's when the virtual machines help. I am able to run a virtual Windows box and still have all the functionality. It saves me a lot of time and allows me to run Linux, but still have the option to fool around. I think one of the best things about my virtual machine is that I am able to test the exploits that come out on Windows. That was what first got me to using virtual computers. All I have to do is boot up a Windows XP box, make sure it has a valid address and that its up to date and then bang away right from my Linux terminal. I get to see instant results.

I had a problem in the beginning as far as permissions go along with bridging my network card. I did find this to be evident in both versions I tested (newest and previous ones), but both were solved with a simple shell script. Other then that I have had no issues at all and I am very happy with Virtualbox.

I still use virtual machines with Virtualbox on a daily basis. Like I said, I am happy with the performance. As far as recommending it to other people I would say yes as long as it is for home use. I don't think this would be good on a wide scale business just because it is open source and development is not yet up to corporate par. Until then my work will continue to use ESX as its solution, but you never know what the future holds.

Notes:

- Quality – Top Notch
- Price – Free
- Effectiveness – In all ways
- General Notes – There is plenty of documentation online if you run into trouble.

by *Brandon Dixon Jr.*
Network Admin/Security Engineer in Training

Xen Virtual Machine

I have used and plan to continue to use the Xen VM. I occasionally use the Xen packaged with RHEL (Red Hat Enterprise Linux),but I use Gentoo on my main box, and I would use Xen primarily on it. I (no company involved) chose Xen because of its great efficiency.

I have used VMware in the past, and I cannot say I disliked it. I do remember the problems I had getting it to run on my rather old Dell Dimension, but when it ran, it did what I expected. However, there are so many drawbacks to the non-open source nature of parts of VMware that Xen and other open source virtualization software have a distinct advantage over VMware, especially in the community support of the product. The program itself is small, but more importantly, the memory it demands from

my computer is next to nothing. I can run two or three separate instances of Xen and hardly notice any slowing down of my normal workspace.

I have to say that the biggest problem I had with Xen was getting started. On some platforms, such as RHEL, the organization of the Xen kernels and programs are all pre-built and configured into the OS. On those machines, it is very easy (not to mention very pleasant) to start using and loving Xen. Using Gentoo, however, I had to deal with a lot of the configuaration myself. I understood the general concepts of VMs, but I had beginner's troubles while trying to get everything set up.

That difficulty, though, is one of the things I love about Gentoo (if you do not know it, you'll learn it one way or another, and you'll learn it well.) I eventually got used to modifying my kernel for Xen and I became pretty comfortable with utilizing the power of the VM.

I have heard a lot of rumbling from those who are a little nonplussed at Xen admiration, and most of their concerns regarding the need for images and the control of those images. Yet I have yet to see a genuinely better solution, and most other VMs out there work from the same concept. After all, you cannot quite run a Virtual Machine if you do not know what the original machine was like.

Conclusion? One – anyone who asks me about a virtual machine these days gets an automatic *Xen*! response. I know that many corporations are hesitant to leave VMware behind, but I hope they eventually will see that Xen offers power, stability, and flexibility in ways that VMware currently does not.

I've fiddled around with programs besides VMware and Xen, such as qemu – though I'm not sure qemu really meets the qualifications of a VM. Nevertheless, I found that Xen offers a nice and (mostly) easy approach to getting what you want running quickly and with superior stability.

As far as recommending it to companies: I would, I have, and I will. Most companies seem to be pretty set in their ways, which is understandable, but as the adoption of Xen further grows, these companies will eventually take a second look at their setup and decide if whatever they're using is really their best option.

Notes:

- Quality / Price: The quality of Xen is great: 9.8/10! However, seeing as Xen is open source and free, I can't really say that the quality to price ratio, since I'd ultimately be dividing by zero – which, as we all know, is not a nice thing to do.
- Effectiveness: Xen was perfect for my needs. I have not, however, tried Xen on an Enterprise setup, so I cannot say how it would work in those cases. However, seeing how the large Linux Operating Systems are embracing Xen, I have a gut feeling it performs well in any environment.

- General Note: Xen is open-source; Xen is stable; Xen is effective, flexible, powerful – I could go on, but I think you catch my drift. Try Xen out. If you don't like it, let me know. Actually, let Xen know. Open source and community go hand-in-hand, so what you say affects what they do.

And if you chance upon a better VM than Xen, let me know. I should say, though, that I won't be holding my breath.

by Jonathan Edwards

Parallels Desktop

I am using Parallels Desktop machine. Why actually this one? Mainly because Parallels had an OS X port which was easy to install and configure. In the past I have used VPC from Microsoft, Vmware, Virtualbox and Xen and picked Parallels because it was real easy to use and my main computer is a Macbook Pro for work at the moment. Since I need to work in multiple environments my work bout us some licences to Parallels Desktop. I have used some free open source ones and the reason I chose to use Parallels is simply because it was very easy and has an intuitive interface. The newest version offers full DX9 support which is kind of nice of a virtual machine. Really there are no weak points that I can come across besides maybe a virtual machine would not be great for any kind of heavy use of the OS. Things like video editing, audio and 3D model rendering are probably not going to run well or at all on a virtual machine. Other than that, they run great. They are easy to set up so you can go to a client who have a virtual server set up running off your laptop and even plug it into their environment so they can see hands on what you can offer them. Sure no software is 100% intuitive and bug free. However, all the problems I found with Parallels Desktop were very minimal and non deal breakers for me. Sometimes it loses the path of your virtual hard disk after you update the application. Not a huge deal, just replug the path back into the configuration and you are off. In my opinion and my experience I would recommend Parallels Desktop to others who have not tried it.

Notes:

It is hard to put a number on something so useful. I would say it easily deserves at least an 8 out of 10 maybe a 9 but definitely not a 10 because I don't think anything is perfect or with out flaw. It is worth the investment.

by Thomas Larkin

VMware Server Console 1.0.3 BUILD-44356

I have been using VMware Server Console 1.0.3 build-44356 for some time now. I chose it because it is free, however there is a licensed version with technical support.

This virtual machine is also more efficient than Microsofts Virtual PC 2007 and it works on Linux. Previously I have used Microsoft Virtual PC 2007. I hated it. Proprietary is not an option. When deciding which Virtual Server to use, I was considering Xen, Winehq, QEMU, coLinux. Winehq was not as robust as VMware. VMware is getting great reviews in the Linux magazines. What are the good and the weak points of the machine? Well... It is running WinXP SP2 without errors. The only problem with VMware is that there is no direct I/O access to DVD-RW causing copy failures. VMware causes Linux Ubuntu Feisty Fawn to drop USB drives. VMware will not see USB devices if Feisty recognizes them. They are not shared between the Operating Systems.

VMware has never had problems as long as VMware Tools is loaded. One issue is the dynamic USB storage media allocation doesn't seem to work for me. I would choose VMware again. I would highly recommend VMware server to anyone you asks about VM's. VMware will emulate Solaris, Novell Netware, Macintosh,Windows, and Linux.

Notes:

- Quality/price – 10
- Effectiveness – 9
- Final – 9.5

by Stephen Baker
Computer Forensics Investigator

MS Virtual Server 2005 R2

I am using MS Virtual Server 2005 R2 and also XEN Virtual Machine. I will try to focus on the first one. To be honest I am using MS Virtual Server 2005 R2 because company I work in has an enterprise-agreement to use it, for some special purposes i get an license for home-use, too. I have been using VMware Server (free version from 2006) and Workstation Version 5.2. They were very good and well designed so I never had any problems with it but my company gave me MS VS 2k5 R2, so i changed. MS VS 2k5 R2 is very nasty, it doesn't support 802.1q-Tagging (VLAN) nativly, you can't pass-through usb or some other interfaces. The support is weak, at the moment, (the one for *Virtual PC* is better...) but therefor you have a very nice web-gui to administrate (big drawback: you need to install iis) and it fits perfectly into AD-environments. If it wasn't a *present*, I would never buy this and I disadvice everyone who ask to buy it now. I hope upcoming releases will be better (one men of the MS supportstaff promised).

Notes:

- Quality/price – 2
- Effectivenes – 4
- Final, general note – 3

by Lorenz Kaminski
Junior Networking Engineer Competence Center IT-Security