Virtualization Runs Into Some Potholes

Virtual servers are going strong, but virtualized applications still need some help

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Managing physical servers and applications has always been yeoman's work. Virtualization—the technical sleight of hand that packs more servers and applications onto fewer computers—adds to the load. Where once there were 10 servers, 20 now run. Three copies of Linux have morphed into 15. And the people managing them? That stays the same. It's the double edge of virtualization: Hardware and software efficiency comes at the system administrator's expense. But IT departments are getting better at managing it all, thanks in part to some new tools.

WellSpan Health offers a lesson in how things get complicated.The Pennsylvania health care provider consolidated 15% of its 350 servers over the past 12 months. Tony DeFelice, manager of end user software, wanted to take the next step and virtualize a key patient-care application. DeFelice started by virtualizing the software needed by clients to interact with the application, and he sent the code over the Internet to thousands of clients. When it came time for caregivers to use the application, however, it wouldn't work. What went wrong? The software wouldn't load on client machines unless someone with administrative privileges reset PCs to accept them. DeFelice learned the hard way that extending virtualization to more users and applications adds a layer of management complexity.

Tools to help deal with that complexity include Symantec's Live Migration and Altiris' Wise Package Studio. Trigence, a startup, has just rolled out software that watches an application as it runs and figures out dependencies, including any left behind when an application moves to a different version of an operating system at its new virtual machine host. Operating system virtualizers move the operating system and its application together to another server, duplicating the exact same version of the operating system. If you want to upgrade the operating system,

Trigence-style application virtualization is better. It helps by searching the operating system files at the new host and discovering missing pieces. Seventy-nine percent of companies with 500 employees or more have adopted server virtualization or will within a year, according to a survey of data center managers by Sage Research. Intel and Virtual Iron last week laid out the economics of virtualization in a Webcast, making the case that virtual servers are a way to contain the escalating electricity costs associated with expanding data centers. Virtual Iron last month demonstrated an advanced management platform, Virtual Manager, which allows for automated management of a variety of virtual machines based on predetermined policies.

Tear Down, Set Up
As service-oriented architectures break up applications into thousands of services, virtualization plays a role by putting them in digital packages and telling a virtual machine what it is the applications need. Applications as virtualized services will be easier to set up, tear down, scale up, or relocate to more powerful servers as traffic mounts, a chief requirement of services on the Web.

Virtualization Styles
Virtualization isn't just for operating systems. Users can virtualize applications and create containers of virtual operating systems.

Operating System
Operating system virtualization takes a particular instance of the operating system, packages it as a set of digital files, and assigns it limited machine resources, such as memory and CPU cycles. Each virtual machine has its own copy of the system.

Application
Application virtualization takes a particular instance of an application; understands the software drivers, files, and data it needs; packages them as a set of digital files; and notifies the prospective host system of those needs.

Containerization
Both Linux with VServer and Unix in the form of Sun's Solaris 10 can run multiple virtual machines using just one copy of the operating system. This approach reduces complexity without giving up the separation and data security of virtual machines.

"Virtualization promises to ease all of these onerous chores," says Gordon Haff, an analyst at Illuminata. But virtualization requires more than just virtual machines. "It requires their effective management," he says.

EMC's VMware division has upgraded two products, the Virtual Machine Importer and the P2V Assistant, which moves software running on physical machines to virtual machines, and combined them into VMware Converter 3. VMware also is

automating the upgrade of its hypervisor system, ESX Server, so that users of an application running in an ESX Server 2.0 virtual machine won't notice more than a brief pause as the application gets upgraded to the present release, ESX Server 3.0.1. A high-performance form of virtualization, a hypervisor is a kernel operating system, communicating directly with the hardware and bypassing regular operating systems to handle application needs.

Downtime can be avoided because VMware's Virtual Center management tools generate a duplicate of a running system on the upgrade host, interrupt the application at the old location, and transfer operations to the new one. The application renews its operation at the interruption point. At most, the process takes a few seconds, says Karthik Rau, senior director of VMware's infrastructure products.

Cross-vendor virtual machine management is another level of complexity awaiting new automation tools. SWsoft, a supplier of virtualization software, said in August that it's extending its Virtuozzo virtual machine management product to manage virtual machines from other vendors. Tools to manage VMware will be added later this year, and XenSource's Xen, an open source virtual machine generator, will be next. SWsoft is backed by investments from Intel Capital, Bessemer Venture Partners, and Insight Venture Partners.

IBM acquired application virtualization technology in June with its purchase of privately held Meiosys. The company's MetaCluster 3.0 has been used to demonstrate the transfer of an Oracle database from one server to another without an apparent disruption in service. IBM is expected to add MetaCluster technology to its Tivoli system management software later this year.

Newcomer OpenCountry offers a systems management console that includes tools to generate virtual machines under Linux. It can produce VMs running different distributions, including RedFlag Linux from China, Red Hat's Fedora, and the Debian Project's Debian Linux. In September, OpenCountry became part of the Open Management Consortium, started earlier year to set standards for systems management for open source software, including the operation of virtual machines.

Even with new tools, it isn't easy to master all the moving parts. Ty Schwab, information services analyst for Lane County IT in Eugene, Ore., found that moving to application virtualization presents high hurdles. He recently tested Softricity's ZeroTouch and Altiris' Wise Package Studio. "You practically have to be a Ph.D. to use Softricity," he says.

Why Virtualize?
Softricity, acquired by Microsoft in July, is noted for its ability to virtualize Microsoft applications. Microsoft plans to produce its own version of the product but hasn't provided a timetable.

Schwab is now streaming an application into one county department, using Altiris to virtualize it and AppStream to convert it into an online service. But he's far from convinced that virtualization will sweep through all county applications. Lane County is adopting virtualization, like other organizations, to save money, Schwab says. But "application virtualization is not mature enough yet." He will extend it to the county applications that have the fewest concurrent users and lowest risk. "The Sheriff's Department has mission-critical applications. If they go down because of virtualization, it does more harm than good."

That's how businesses feel about most of their applications, and they'll be slow to adopt new techniques and technologies that can't guarantee uptime. Virtualization of servers has proved its worth in many data centers. It will be some time before the same can be said about virtualized applications.