

Application Virtualization: A CIO's Secret Weapon

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Complex migrations and conflicts between applications are just two of the issues that make workstation management so difficult. Application virtualization can ease or eliminate these and other problems. In this paper, Aurélie Chandèze of Best Practices International explains the benefits to application virtualization in detail and describes how to select a quality solution. The paper ends with an application virtualization case study.

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Application Virtualization: A CIO's Secret Weapon

Never-ending deployment, complex migrations and recurring conflicts between applications make workstation management a thankless task. It is also a costly business and is almost always time-consuming.

In a survey carried out at the end of 2010 involving several European companies, International Data Corporation (IDC), the consulting company, estimated that the average cost of managing a PC varied between US\$273 and \$320 a year. You can multiply that number by the number of computers in your organization to get an idea of your PC management costs. Given that half of these costs often relate to charges associated with in-house staff, saving money on this budgetary item becomes very important.

In other words, simplifying the work of operators tasked with managing and maintaining IT equipment represents a powerful means of optimization for organizations, not only in terms of costs, but also in terms of flexibility and productivity.

The Major Challenges of Virtualization

More and more organizations are interested in virtualization precisely so they can control costs and increase flexibility and productivity. Virtualization is now in widespread use for servers and has already proved its worth there. Now organizations are looking to extend this approach and are assessing the possibilities of virtualizing client workstations. In a survey carried out by analysts at Forrester Research in August 2011 involving 546 IT decision makers, only 10 percent of respondents did not have a project of this nature in place. Half of respondents had client virtualization projects involving between 1 and 500 users and 63 percent of respondents planned to exceed this amount in the next two years. According to Gartner, virtualization represents the "challenge that will have the greatest impact on infrastructures by 2015."

Of the companies that responded to the Forrester Research survey, 61 percent cited a reduction in costs among the motivating factors behind these projects. An improvement in security was cited by 59 percent of respondents and the simplification of management and distribution

of remedial action by 51 percent. Forty-seven percent of respondents were concerned about problems with operating system migration and 42 percent about simplification of application deployment.

Different Approaches to Virtualization

Virtualizing the Workstation

You can use several approaches when it comes to virtualizing the client workstation. Most virtualize the working environment in its entirety:

- Centrally from a data center (virtual desktop infrastructure, or VDI)
- Locally through the integration of a hypervisor on the machine or on the operating system
- From the cloud (desktop as a service, or DaaS)

These approaches have their advantages, but each of them requires certain prerequisites:

- Hosted approaches (VDI or DaaS) require a stable network. The VDI also requires the installation of a specific infrastructure in the data center.
- For local approaches, you must install a hypervisor on the workstation. This can then run different operating systems and environments according to the application requirements.

Virtualizing the Applications

Application virtualization adopts a different approach. It does not virtualize the operating environment, only the application layer. This way each application can be run on its own, independent of the environment.

Each virtual application consists of a complete executable package, including all the settings, components, files and libraries needed for it to function. These virtual applications act as if you had installed them locally, but they do not have to modify the environment, registry or operating platforms such as Java, .NET framework, Flash and so on.

Avoiding DLL Hell through Virtualization

Dozens of applications coexist with the operating system on any given workstation. In order for these to function satisfactorily, the Microsoft Windows operating system relies on dynamic link libraries (DLLs). Without these files the workstation would not function, as these libraries allow different applications to share pieces of code or resources so that they can carry out particular tasks.

Most users have, at some time or other, been confronted with the message: Missing DLL or DLL not found or even Corrupt DLL. These somewhat unsettling messages most often occur when users have installed new applications. The problem is that IT teams cannot test all the applications for each operating environment due to time constraints and cost. Even with packaged applications that the producer has tested, the problem of missing DLLs can still occur.

Reasons for these malfunctions include the following: a program uninstalled a DLL when the DLL was needed to run another application; a program replaced a DLL file with an older version; a defective or incomplete installation corrupted a DLL; a DLL file was deleted by the user; a virus deleted or damaged a DLL file; or a hardware problem (on the hard disk, for example) caused the error messages. As you can see, there is no shortage of possible malfunctions.

So how can we avoid falling into "DLL hell"? The answer is application virtualization. Once virtualized, an application becomes a unique file that users or IT staff can easily install (for example, from a simple USB drive) with a single click. The virtual application does not require a specific installation process and is not dependent on external components. This eliminates DLL conflicts. If "DLL hell" is a nightmare for workstation administrators, virtualization is a dream come true.

Advantages of Application Virtualization

For Operators: Saves Time and Offers Better Security

FEWER CONFLICTS, MORE SECURITY

Virtualizing applications also means that you can reduce or eliminate conflicts between applications. Your organization can easily avoid problems associated with DLLs or registry keys. Similarly, when applications require different versions of browsers or Java, .NET or Flash operating environments, it is no longer necessary to have them coexist on the same machine: They are part of the virtual applications' .exe files.

Teams in charge of maintenance and application support therefore gain precious time while application virtualization helps secure the work environment. There is now no need to leave otherwise obsolete components on workstations just so certain applications can work.

FASTER TESTING AND DEPLOYMENT

This approach also makes the testing and deployment phases considerably simpler. Application virtualization avoids conflicts with the existing environment, which reduces the need for integration testing. In addition, all you need to do to install a virtual application is copy the .exe file. To uninstall it, you just delete it. By avoiding installation and uninstallation procedures, you can make professional applications available more rapidly.

ENHANCED PORTABILITY

Finally, you can run virtual applications in several ways: from USB drives, DVDs or even through predictive streaming. Running the application from a USB drive means users can launch it from any workstation equipped with a USB port. If users modify the application (with the addition of bookmarks in a browser or templates in a word processor, for example), the virtual application will store the changes on the USB drive.

On the other hand, when a user launches the application from a DVD, the system copies the executable package and then runs it directly on the machine. When the user closes the application, the application does not store any changes, as a standard DVD does not allow rewriting.

These two methods allow users to easily take applications with them, thereby offering enhanced portability. They also offer the advantage of not leaving any trace on the host machine.

Five Good Practices When Migrating to Windows 7

1. Run all applications as executable files to avoid installation phases and application conflicts.
2. Gather all virtual applications in a common file storage zone so that employees can download and run them as required.
3. Use predictive streaming to make all virtual applications, even the largest, function directly. Users can access the applications via the Internet or your organization's intranet.
4. Set expiration dates for each application to ensure that you do not use obsolete or withdrawn licenses.
5. Give users who need Internet Explorer 6 the option to continue using it with Windows.

With predictive streaming, you make the application available from a website or network location. This means remote users always have access to their applications when required. When a sufficient proportion of the application has downloaded to the workstation, users can run it and do not need to wait for the full download to start working.

For Companies: Productivity, Flexibility and Cost Control

IMPROVEMENTS IN PRODUCTIVITY AND SERVICE CONTINUITY

Application virtualization significantly reduces the time IT needs to deploy applications or to update them. You can therefore keep service interruptions to a minimum and increase worker productivity. This allows IT to ensure service continuity to clients and users.

INCREASED FLEXIBILITY AND MOBILITY

Application virtualization also improves worker flexibility, allowing workers to access new operating systems and functional applications more quickly. In addition, users can easily take their applications with them, providing increased mobility.

SIGNIFICANT REDUCTION IN MAINTENANCE COSTS

By simplifying the work of operators and improving the robustness of applications, you can reduce maintenance and support—restrictive tasks that generate no value for the organization. You can then use the resources saved in this way for more important or valuable tasks.

GUARANTEED COMPLIANCE FOR THE APPLICATION PORTFOLIO

You can give virtual applications expiration dates, which means you can have IT automatically deactivate applications whose licenses have expired.

Ten Things to Look for When Selecting a Virtualization Solution

When selecting an application virtualization solution, there are several criteria to take into account:

1. **Speed.** Ideally, users should be able to select applications and create the virtual version with a simple click. Virtualization of the application portfolio should be as quick as possible.
2. **A detailed analysis of workstations.** Administrators should be able to analyze all applications available on workstations so that they can automate virtualization.
3. **Support for different operating systems.** The solution should account for different versions of the same operating system so that you can more quickly complete migration projects.
4. **The ability to create a unique executable file.** The virtualization solution should group all files, settings, runtime libraries and other application components in a single and unique executable file.

5. **Predefined models.** The solution should offer predefined models for popular applications (Office, Firefox and so on), thereby speeding up the creation of virtual applications. You should be able to easily update these models via a web directory containing the latest versions.
6. **Control of application service life.** You should have the option to include an end date in virtual applications. This allows you to test an application for a limited period or control how long applications are available to trainees or temporary workers.
7. **Infrastructure independence.** The solution must be agentless. In other words, it should not need specific infrastructures (such as hypervisors, network connections, servers or agents). This will reduce the total cost of ownership.
8. **Ease of use.** The solution should offer a way of creating a virtual application that groups existing applications and their settings, so you can easily virtualize your existing application portfolio. This method also guarantees that the code you distribute is the correct, up-to-date code.
9. **Customization.** The solution should allow users to select the software components they want to run. For example, they should not have to load and run an entire suite when they only need one particular tool.
10. **Optimized performance.** The solution should be designed to optimize the performance of the applications in use, with predictive streaming technology such as offered by Micro Focus® ZENworks®. Applications loaded using predictive streaming should then be able to run in offline mode.

Case Study: How Aix-en-Provence City Council Virtualized Its Applications

The Aix-en-Provence city council has almost 2,500 users with 1,500 workstations spread over 70 sites. Most of the sites are linked by fiber optic cable.

“Each department operates almost as a separate entity with its own particular requirements,” said José Melgar, the city’s head of networks and systems. “Apart from a few large council-wide applications, such as accountancy, human resources management and invoicing, the municipal departments each have their own applications, such as services and markets, civil registry, town planning, etc.” That equates to a large number of applications that the authority must manage.

Virtualization allows applications to keep performing without losing time due to incompatibility issues.

"A lot of these applications change and must be updated on a regular basis," Melgar said. This often creates incompatibility; some no longer work when used with a new browser version, for example. Similarly, system changes can prove complex to manage. When the city migrated its workstations from Windows XP to Windows 7, the transfer from a 32-bit system to a 64-bit system led to several malfunctions.

With this in mind, the council wanted to put a solution in place that would simplify the management and deployment of applications. The key objective was to reduce the amount of time spent managing new versions, which was occasionally considerable. "Sometimes it would take almost a week to rework the master for some applications on remote deployment products," remembers Nicolas Dupart, who is in charge of managing workstations in Melgar's department.

The council had been interested in virtualizing workstations for some years and was aware of the different approaches. The team quickly turned to application virtualization to meet its need to simplify. At the end of 2011, the city selected Micro Focus Application Virtualization after evaluating four market solutions. "Applications were easier to virtualize. Moreover, the solution offered a certain number of virtualized application models that just needed adapting. For applications such as Internet Explorer that are relatively difficult to virtualize, it really made the task a lot easier," Melgar said. Another advantage is the ability of Application

Virtualization to virtualize several applications in the same package. "In the space of half a day, we were able to virtualize the application managing the civil registry with the client Oracle," Dupart said, "whereas before, every new version of the application took two people a week, which is how long it took to stabilize the environment." The solution also made deployment much easier. All the staff needs to do is activate a link to an executable file; without virtualization, remote distribution required forward planning so that the process did not disrupt workers.

Today, the council is virtualizing problematic applications as a priority, especially those involving complex deployment or functions that get interrupted by a change in operating system or browser. "Since the solution has been operational, service continuity and reactivity are much improved," Melgar happily reported.

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