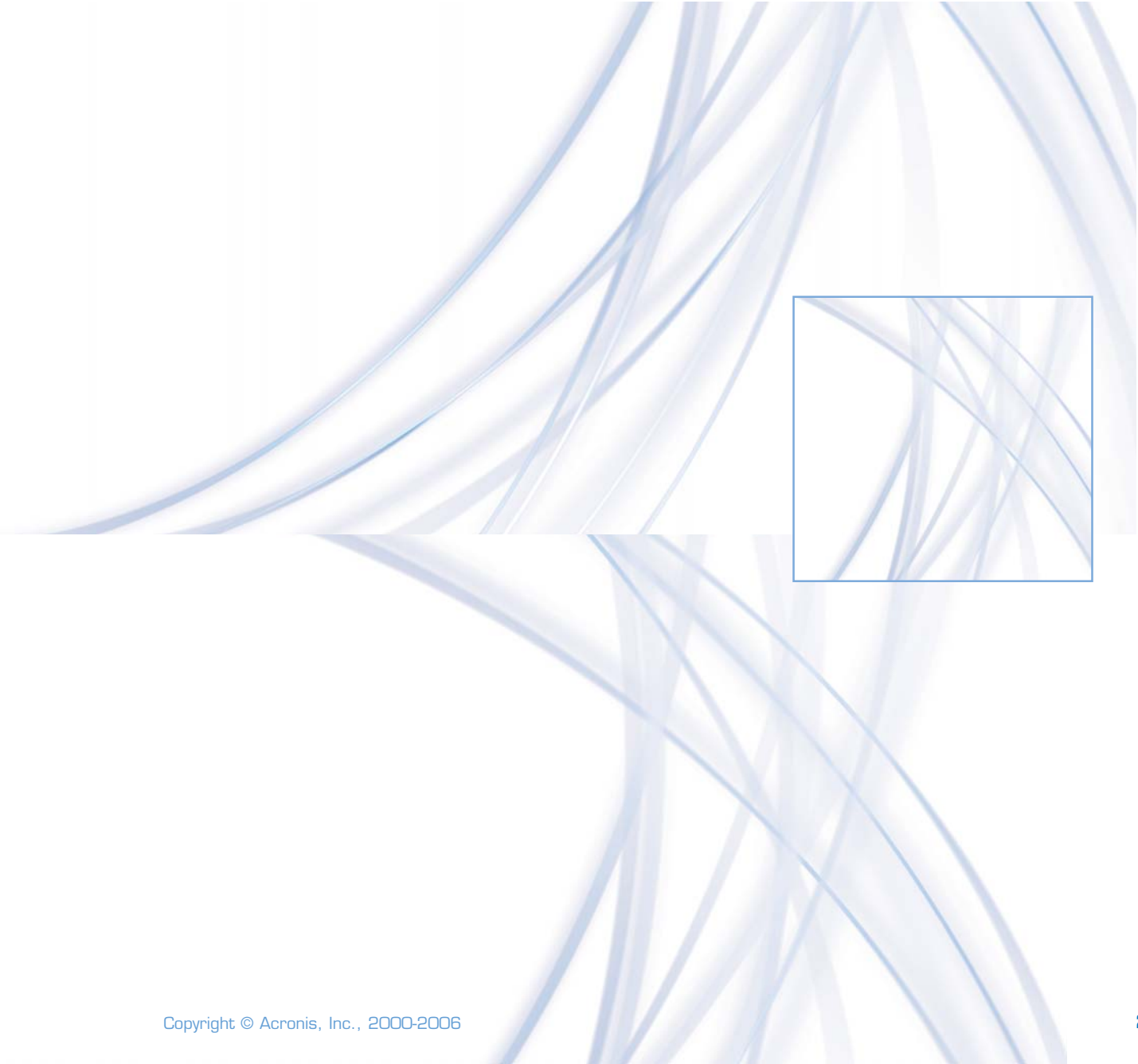


Tips and Techniques for Migrating to Virtual Servers

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Introduction

IT organizations today must handle huge amounts of information and manage a complicated heterogeneous environment composed of more and more computers running Windows, Linux, UNIX and other operating systems. As infrastructure complexity grows, management costs increase considerably (figure 1).

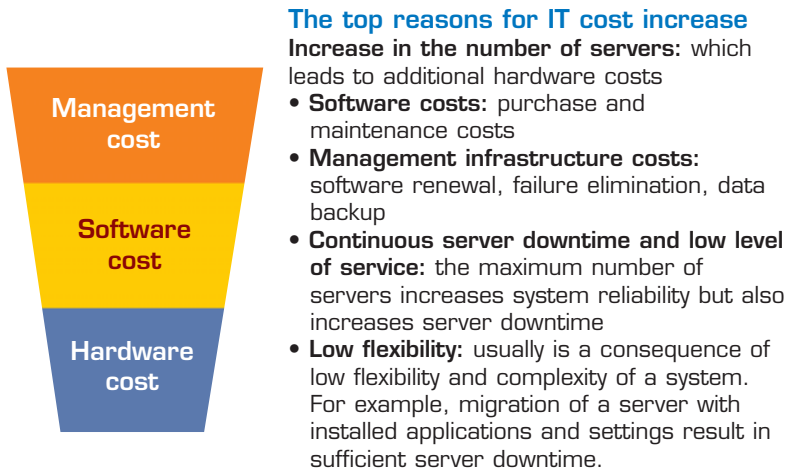


figure 1

The result of this continued expansion is an inflexible, complicated infrastructure. Fortunately, operating system choices are narrowing as organizations standardize on a few market leaders, and new technologies are emerging that promise to greatly increase IT flexibility and cost efficiency. These trends have got a lot of IT managers thinking about migration these days. Migration is the process of moving software and databases from one computer to another. As organizations consolidate platforms, IT departments are being called upon to manage migrations smoothly and quickly so as to get the benefits of more powerful hardware with a minimum of disruption.

Migration can be complicated and even dangerous when production servers are involved. Many IT organizations don't have the luxury of extensive test and staging environments and so must plan for migrations in real time. There are tools that can help, but their capabilities differ considerably. This white paper outlines some issues to consider in selecting a toolset.

One very promising technology is virtualization, a "hypervisor" that enables computers to run multiple operating systems and applications on the same physical server. Virtualization is one of the most exciting server technologies to emerge in the last two years. Its compelling benefits have captivated IT managers because of the dramatic payoff.

Virtualization standardizes and unifies working environments, improves fault-tolerance, uses the resources of a server more fully and effectively distributes resources between various virtual systems. A virtualized environment has three basic characteristics:

- **Division:** one server can handle many operating systems and applications. Servers can migrate both from physical to virtual machines and vice versa.
- **Isolation:** virtual machines are fully isolated from the host operating system and from other virtual machines on the host. If one virtual machine fails, it will not affect the functionality of other virtual machines.
- **Encapsulation:** a virtual machine includes virtual hard disk files and virtual machine configuration files. It's easy to create, back up, move and copy virtual machine templates and move fully configured operating systems from one server to another.

These features yield a variety of benefits for IT:

- Hardware resources are used more efficiently.
- Security is improved because the operating system and hardware are isolated from each other.
- Legacy applications can be redeployed to more efficient hardware.
- IT organizations can scale server resources up and down as needed.
- IT staff resources are deployed more efficiently because of economies of scale.

No wonder Gartner calls virtualization a "megatrend," and International Data Corp. forecasts spending on the technology will reach \$15 billion in 2009.

Getting there from here

Computing environments are becoming more complex. Operating systems are larger than ever, with more features and moving parts. A profusion of patches and updates for everything from drivers to databases only complicates things. In most organizations, no two servers are exactly alike.

This can present challenges in a migration. Unless both the source and target environments are identical, even minor incompatibilities may add hours to the process or thwart it entirely. These "gotchas" can complicate a seemingly simple process and create chaos when production servers are involved. Migrations should only be undertaken after careful analysis and selection of the right tools for the job.

Virtualization presents some new complexities and challenges because instructions to the hardware must be intercepted and interpreted by the hypervisor. These hidden "gotchas" can thwart IT's efforts to migrate existing applications to a virtual environment and even threaten the stability of mission critical applications. IT managers should be excited about the opportunities of virtualization, but should take these "gotchas" into account.

Virtual machines work best when all the software is installed and configured directly into the virtual environment. However, many IT organizations will find that the bigger benefit is in consolidating: moving many physical servers to a smaller number of large servers running multiple virtual environments. This migration is sometimes called physical-to-virtual and it can be more complex and intricate than a fresh install because applications might still be in production. This presents the potential for error and disruption.

A migration, whether virtual or physical, should involve as little software re-installation and database translation as possible. Ideally, the two environments should closely resemble each other so that machine-specific instructions that on the source machine also run on the target.

Changing plans

Experienced IT professionals know that data and applications outlast computers. This means that you need to plan migrations with an eye to the future and the possibility that you may want to migrate again, whether to another virtual architecture or even to a physical one.

Why would you want to move from virtual to physical? While most applications run as fast in a virtual environment as they do in a physical one, some don't take well to virtualization at all. These may include database- or CPU-intensive applications, where the virtual translation layer can get in the way of performance.

Applications also grow over time. As the number of users and transactions increases, the software can actually outgrow the virtual machine that it occupies. This could constrain the organization's ability to use the application and affect other software running on the host server.

Careful planning can mitigate this problem, but you should consider a contingency plan. The ultimate solution would be to have the flexibility to move easily back and forth between physical and virtual environments.

In situations where the environment is not right for the application, companies may decide to move a poor-performing application from a virtual machine back to a physical one, a process called VTP. In other cases, the software might need to be migrated to a different virtual machine with more capacity, a process known as VTV (virtual-to-virtual).

In a VTP scenario, the operating system and applications must be "un-mapped" from the virtual layer and restored to their original physical server settings. The correct versions of all drivers for the physical hardware must be in place in order to avoid reinstallation. Not all migration tools can handle this task, since most were developed specifically for a one-way migration. Restoring the original physical server settings can be painstakingly slow, so consider whether you want to

prepare for this contingency. In the case of a busy production server, the time commitment may even make migration impractical.

Another option is to move an application from one virtual environment to another (VTV). This might come into play if an application is being moved from a virtual machine with lesser capability to one with more advanced performance and management features. Or a company may choose to standardize on a single virtualization product and migrate its applications from other virtualization platforms to the new standard.

The ability of commercial migration tools to support these multiple migration scenarios differs dramatically. If you are uncertain about your future performance needs, consider a tool that accommodates changing plans.

Customizability

All migration tools do a pretty good job of moving applications and data from a typical physical environment to a typical virtual one, usually in a highly automated way. But not all migrations lend themselves to drag-and-drop simplicity. As mentioned earlier, operating environments are becoming more complex and that means that migrations may require customization. Some IT organizations might want to write scripts to automate tasks such as assigning IP or subnet addresses, synchronizing with a physical server or performing scheduled tasks. Some automated tools don't support a command-line option to enable this flexibility, so ask if the option exists.

Tools also differ in their ability to support migration of servers that are already in production. In these cases, the server must be virtualized while transactions are still taking place. Then, the virtualized server must synchronize with the physical server and cut over without losing data. Again, the IT staff may want to customize this process so that, for example, certain processes take priority in a restore operation.

The Acronis difference

The live migration solution from Acronis, Inc, is fundamentally different from that of other vendors. The company's expertise is in disk imaging. Its patented Snapshot technology creates an exact image of a server for backup or rapid deployment/migration purposes. Acronis' Universal Restore is a revolutionary technology that permits disk images from one server to be deployed to a different physical or virtual machine.

Acronis Full Circle leverages Acronis' years of experience in disk imaging and migration to provide the fastest and most flexible migration toolset in the market. It enables quick and efficient physical to virtual, virtual to physical, virtual to virtual, and physical to physical migration. Any physical machine with all applications and settings may be migrated in minutes with zero downtime. If your company has used one virtual environment for a long time but now uses another one, Acronis Full Circle will convert all old virtual machines into a format of a new virtual machine.

Most popular virtual machines from VMware, Microsoft, and Parallels are supported! Acronis Full Circle is fully compatible with Acronis True Image disk images: any disk image with a *.tib extension may be easily converted into a set of files of a virtual machine. Physical to virtual and virtual to physical migration has never been easier or faster before with Acronis Full Circle.



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