



A White Paper by Stratus Technologies
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**Seven Virtues of Virtualization:
Avoiding Deadly Mistakes that Doom
Business-Critical Service Management**

Abstract

Without proper planning, even a technically brilliant virtualization effort is destined to meet an unwelcome fate. Lack of attention to process and people factors are often to blame. For business-critical IT services, the stakes are high because objectives such as improved disaster recovery capabilities are at risk. This paper identifies common mistakes in project planning and project management, and explains how to keep them from diminishing virtualization's benefits and even undermining your entire initiative.

How Virtualization Changes the Rules

Virtualization brings benefits by breaking the mold. One physical server is no longer limited to playing host to a single operating system. And with virtual machines supported by virtual infrastructure, an application need no longer be tied to a particular physical server. In the simplest terms, what happens is that a physical machine that used to do one thing can now do more than one thing. And you can retire the hardware you no longer need.

The virtualization hypervisor, which runs on a computer server to manage physical hardware and I/O devices, is the mechanism that breaks these traditional bonds. Because functions including storage configuration, network configuration and management capabilities exist at the virtual layer, they are configured and managed through that hypervisor.

As undisruptive as this may seem, lines of responsibility are crossed. Applications, networking, storage and backup have traditionally been distinct domains in larger IT organizations. Each one has been handled by separate specialists. Failing to adapt to the way that virtualization blurs these boundaries is at the root of many problems, as we will soon see.

That is why you have to plan well for the changes that virtualization will bring. Not only do you have to ensure the success of the virtualization initiative, but also you must ensure that business-critical IT services will function at the levels of uptime and performance your company expects. Omissions and mistakes during project planning have repercussions at every subsequent step, from implementation, to migration, to day-to-day operation.

In practice, the following steps are frequently not given the time and attention needed to ensure project success.

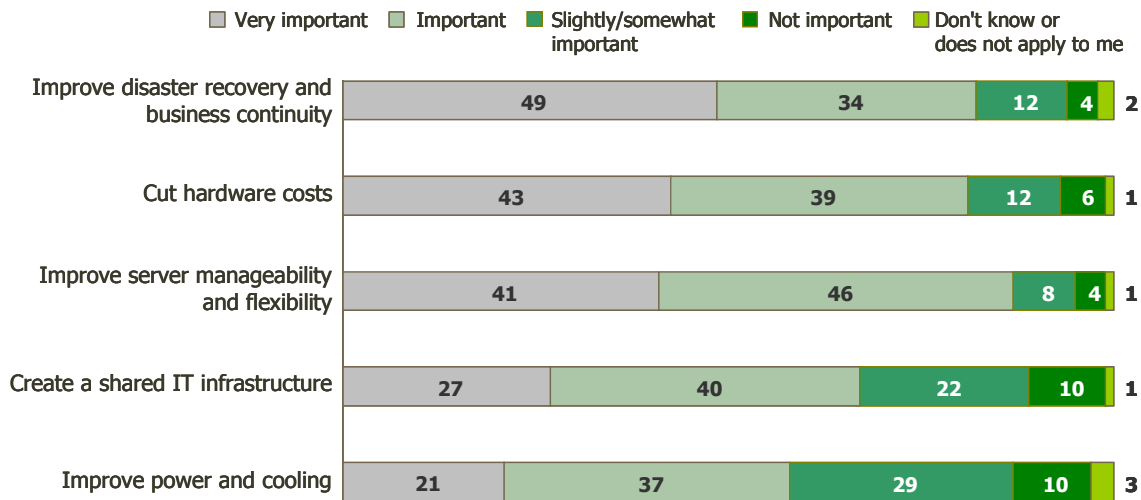
Virtue #1: Define and Measure Success

Congratulations: Your company's virtualization initiative has been approved. Many stakeholders eagerly await the results. But what — and who — is driving the decision to virtualize IT infrastructure? Perhaps the CFO or CIO is seeking the cost savings in electricity, cooling and space that come with server consolidation. Perhaps the IT team sees virtualization as a valuable way to protect the business continuity of critical applications, by implementing faster backup and recovery (restore) capability.

For example, organizations are increasingly interested in virtualization as a vehicle for cost-effective disaster recovery because the hardware at the disaster recovery site does not have to be identical to the main production site. In fact, Forrester Research found that 49% of surveyed decision-makers from North American and Europe regarded improving disaster recovery and business continuity as a "very important" driver for x86 server virtualization.

Figure 1: Server Virtualization Drivers

"How important are the following motivations for adopting server virtualization?"



Base: 197 server decision-makers at North American and European enterprises that are interested in, are implementing in the next 12 months, or have already implemented server virtualization for X86 servers (percentages may not total 100 because of rounding)

Source: Enterprise and SMB Hardware Survey, North America and Europe, Q3 2007
42944 Forrester research, Inc.

For a business-critical service that requires end-to-end performance and high availability or better, virtualization must be done in a manner that aligns with the needs of the business. There will be service levels to meet; business continuity and disaster recovery objectives to support. To assess the potential impact if a business process were to become unavailable or to operate at reduced performance, prepare a business impact analysis (BIA) that identifies risks such as monetary loss and damage to brand reputation.

In short, assess and document business and technical objectives that form the criteria for the project's success. Include a gap analysis to document where you are today and where you intend to go. What's more, establish measurable goals to minimize any disputes over the outcome.

Virtue #2: Get Buy-In

Whether the push to virtualize starts from the top down or the bottom up, or the initial drivers are business or technical, one point is certain. Every stakeholder affected by the decision to virtualize will have ideas about what matters.

To define and measure success in terms that stakeholders will agree with, first you have to get everyone to the table. Lack of buy-in will cause delays in your project or even derail it altogether. When all stakeholders are represented, you are also able to identify project allies, resistors to change and those who have valuable skills you can enlist. Address their expectations and their fears.

Business management is a major stakeholder when you are virtualizing any aspect of the infrastructure that supports a critical business process. Often these managers have made a huge

financial investment to implement and optimize systems they can count on for uninterrupted operation. The availability and performance of the applications, in addition to the availability and integrity of the data, are vital concerns to them. These constituents have to be able to see how they will benefit from virtualization.

Virtue #3: Take a Baseline

Because virtualization touches every aspect of an IT environment — from applications, to networking, to storage, to asset management, to security — you should understand all the implications before proceeding.

Forrester Research writes, “Applications are now so interdependent that one highly resilient application may utilize data from multiple applications with lower levels of resiliency. In the event of a disruption, highly resilient applications are at the mercy of their less resilient application partners, causing potential critical business processes to fail.”¹ The lesson is that when you improve the resiliency of an obviously mission-critical application with virtualization, you have to consider related applications as well.

Therefore taking a current baseline of your current environment, including service and application dependencies, is a step that should not be shortchanged. This baseline also serves to identify areas of potential risk.

In addition, migrating to a virtual infrastructure exposes weaknesses already present in the environment. But without a baseline the migration will be wrongly blamed for the problem, making the problem harder to resolve. Service levels may drop until the issue is corrected.

For example, the Microsoft® Active Directory® directory service manages identities and relationships that make up network environments. It is vital that these Active Directory servers communicate with one another using AD Replication. If replication has not been taking place because of incorrect configuration, several issues could occur. For example, a machine or user account could fail to authenticate, preventing domain logon or if a duplicate object is present in the AD, updates will not happen properly.

Virtue #4: Update Policies and Procedures

A traditional division of labor in an IT environment is, “This is the networking team’s job. Nobody else is authorized to do it.” Controls like these are in place for good reason. But when storage configuration, network configuration and management capabilities reside at a virtual layer, the basis for the rules is changed. Policies and procedures must be updated because virtualization blurs the previously sharp boundaries between domains.

Policies and procedures have a make-or-break impact on the management of business-critical IT services. Controls over virtual machine provisioning and change management in production environments are two important areas.

Say that you are using server virtualization to consolidate applications, but have not updated the change management procedure for software patches. This leads to someone not testing a patch sufficiently before putting it into production. Their mistake causes all the virtual machines and applications on your most critical server to crash. When vital business processes are knocked out

¹ Forrester Research, Inc., *X86 Server Virtualization for High Availability And Disaster Recovery*, October 24, 2007

even for a short time, the downtime may cost your company many thousands of dollars.

Updated policies and procedures must be supported by clear, seamless communication. You will overcome a classic obstacle to so many IT initiatives: significant delays in lining up resources.

For example, poor communication leads to the server team having one expectation while the network team has another. Getting a cable run between one physical server and another may take weeks as a result, holding up the implementation of your virtual infrastructure. Then you have a tremendous investment in resources sitting idle, waiting to be connected.

Virtue #5: Do a Reality Check

An experienced professional can do a typical physical-to-virtual, or P2V, migration in somewhere between two to four hours. Yet what requires only a couple of hours from a technical standpoint may merit weeks of time in a production environment. The road to disappointment is paved with unrealistic assumptions about implementation and migration requirements.

Overly aggressive assumptions may also leave your management and colleagues with the impression the project flopped, even when it was completed in a reasonable amount of time with good results.

Underestimating the complexities of your production environment exposes you to risk. For instance, you cannot afford shortcuts in any necessary pre-production testing when your business service has little tolerance for slow response time or even the briefest of application outages. Moreover, you will want to schedule the cutover to your virtual infrastructure wisely so that migration does not take place during a peak processing time.

When your company is in a highly regulated industry, such as life sciences or pharmaceuticals, using a pre-validated virtual machine may eliminate platform qualification testing that would otherwise be mandated. But you still have to allow time for that virtual machine configuration to be pre-validated.

Virtue #6: Don't Settle for Less

Skimping on planning and project management is a sure-fire way to get less out of virtualization than you expect. Some IT departments end up using virtual machines in much the same way as physical machines, just to get their environment functioning without spending time to prepare for the change. They miss opportunities as a result.

Backup and recovery illustrates this point well. Nothing dictates that backup and recovery in a virtual environment has to be different than before virtualization. Put an agent on the computer server. Back up. Restore it from tape. The process works as well or as poorly as before.

But when you are prepared to utilize the capabilities of virtualization for backup and recovery, you can probably restore that system some 80% faster. That's no insignificant improvement, given the importance that organizations place on disaster recovery. According to Forrester, 21% of North American enterprises and 14% of European enterprises deemed "significantly upgrading disaster recovery capabilities" a critical IT priority for 2007.²

² Forrester Research, Inc., *Business Technographics® North American And European Enterprise IT Budgets And Spending Survey*, November 2006

You may even find yourself facing resistance to change that could spell the demise of your initiative. If you did not get stakeholders to buy in at the beginning, people may refuse to accept the virtualized infrastructure although they will lose out on meaningful benefits.

Virtue #7: Enlist a Trusted Advisor

We've seen how virtualization changes the established order. Because it represents change, your rollout will almost certainly cause people to worry about loss of control. An objective third party can serve as the agent of change involving all stakeholders in the process, so that they do not go on the defensive. A professional services provider offering expertise in both virtualization and mission-critical computing can serve as a trusted advisor from the planning stage through day-to-day operation of the newly virtualized infrastructure.

Moreover, today's wave of virtualization is new enough that even Fortune 1000 companies may not have sufficient resources and experience on staff. And IT departments are busy enough keeping current infrastructure going; typical staffing levels leave little or no time for new initiatives.

Experience counts as well. Any alteration to your IT environment can bring up new problems. A professional services provider can bring knowledge of issues that other companies have encountered and the solutions that worked. You will be able to foresee and address risk. That's particularly valuable to accelerating deployment of virtualization in industries where systems are subject to rigorous governance and regulation.

Conclusion

Skillful attention during the planning phase mitigates exposure that can put the outcome of your virtualization initiative at risk. Enlisting the right professional services organization not only helps you avoid mistakes, but also helps ensure that your newly virtualized infrastructure meets the uptime and performance goals of your business-critical IT services.

About Stratus Technologies

Stratus Technologies is a global solutions provider focused exclusively on helping its customers achieve and sustain the availability of information systems that support their critical business processes. Based upon its 27 years of expertise in server and services technology for continuous availability, Stratus is a trusted solutions provider to customers in manufacturing, life sciences, telecommunications, financial services, public safety, transportation & logistics and other industries.

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