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Virtualization Backup and Recovery Solutions for the SMB Market

The Essentials Series

Developing a Backup Strategy for Hybrid Physical and Virtual Infrastructures

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by Don Jones, Series Editor

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Developing a Backup Strategy for Hybrid Physical and Virtual Infrastructures

Small and midsize businesses may find that either a mix of virtualization platforms or a hybrid physical and virtual infrastructure makes selecting a single solution difficult. Being able to put best-of-breed solutions together as part of a cohesive backup and recovery strategy is going to be critical to any business.

The critical first step is to survey the existing infrastructure to see which workloads are virtual and on which platform they reside. For a variety of reasons many businesses use multiple different hypervisors and even still some physical workloads. This decision can add to the cost and complexity of supporting a proper backup and recovery plan.

The first articles in this series discussed the goals of improved recovery time objective (RTO) and recovery point objective (RPO). Each backup and recovery solution is going to have a different effect on RTO and RPO. Even the best physical server backup solutions are not going to have the type of RTO and RPO advantages that a well-designed virtual backup solution will. So what is a business with virtual servers and legacy physical servers supposed to do to ensure a complete backup solution?

What Kinds of Integration Are Possible with These Two Different Backup Solutions?

One of the biggest challenges that a business can face in disaster recovery is trying to balance the need for quick and complete backup and recovery with the technical differences of multiple platforms. Ideally, a business is going to have a centralized strategy for backup that involves a single hypervisor platform, but this isn't always the case in practice.

Integration doesn't always mean that the platform or platforms selected for backup have to be tightly integrated from a management standpoint. Integration also applies to the storage of backups and the processes for implementing, testing, and verifying those backups.

Both virtual and physical backups are going to have the same options for storage. Disk-based storage has come down in price so much that it has supplanted tape as the storage medium of choice. This has led to faster backup and restoration for both physical servers and virtual ones. Disk-based backup isn't the only option, though.

The cloud has become an ever-present force in driving more flexible backup and restoration options. Many organizations have been building their own private cloud infrastructures to address the need for disaster recovery resulting from the loss of a site. Realistically, though, many smaller organizations aren't going to be able to afford the cost of building, testing, and maintaining a private cloud.

To leverage the cloud most cost effectively, a small business is going to need to rely on someone else's cloud. The good news is that the cloud options are much more extensive than they were just a few years ago. Security and scalability of general-purpose cloud backup infrastructures are greatly improved. Nonetheless, there is still going to be extensive work to get it all into a cohesive plan.

One of the best features that can contribute to a cloud-based effort is an integrated cloud backup solution. Leveraging a backup solution for physical and virtual servers that is designed with some form of cloud integration will eliminate the possible problems with trying to fit one vendor's backup platform into another vendor's cloud. This integration will save time and money. Most important, when a cloud backup option is part of the backup platform natively, there are none of the compatibility problems that can wreck a well-planned backup strategy. Direct cloud integration will work more reliably because the backup vendor has built the solution and tested it end to end.

Integrating the Old and New into Something Coherent

There will be times when legacy physical servers are going to be a fact of life. One of the first things to do is analyze why there may still be physical server workloads in the network. There should be little reason to have physical server workloads in place at the present based on the maturity of virtual solutions.

Most physical servers that are still in operation are the result of either specialized hardware needs that aren't supported under the particular virtualization platform, or the business is engaged in other priorities that have meant that a full server virtualization is in progress or planned, but not yet complete.

Dealing with legacy physical servers is going to be a fact of life for some businesses. However, this doesn't mean that other legacy technologies need to be a part of the equation. Combining the physical and virtual servers with image-based backups that go from disk-to-disk and ideally disk-to-disk-to-cloud will help overcome many of the challenges inherent to still leveraging those legacy servers.

Getting the Most ROI with the Lowest TCO

The most ROI is going to come from leveraging a single solution for backup and recovery. The costs for licensing, training, and support will scale best when a single backup and recovery platform is used. This also means that a single virtualization platform is going to fit best with optimal ROI. Keeping multiple hypervisors in play will mean that multiple solutions for backup are going to be needed. To keep cost and complexity down, businesses are increasingly standardizing on a single hypervisor.

In order to truly analyze the ROI and TCO aspects of a backup and recovery solution, the first item to look at is the type of environment. VMware's vSphere platform has been the market leader for some time, and trends show that this will continue to be the case for the foreseeable future. Accordingly, vSphere backup solutions are going to be required. Businesses are going to continue to deploy vSphere for the bulk of virtualization requirements. With the new vSphere 5 release, there are several enhancements that are going to continue to drive this adoption. Using a backup solution designed and supported with vSphere 5 will be crucial.

With that said, there still may be two types of environments that are going to have different challenges. We have to start by looking at what type of environment by asking a few questions and then determining how to best fit that to the model for backup and recovery.

Is It a Virtual Environment?

Virtual environments bring advanced options for quick backup and restoration. This is due to the fact that the virtualization platforms were designed to isolate the operating system (OS) from the physical hardware in such a way as to make backups possible from outside of the guest (OS). The virtualization platforms also were designed with programming interfaces that make it much easier for third-party applications to perform backups that are certain not to adversely impact the running guest virtual servers.

VMware's vSphere in particular uses a series of APIs for storage interaction that enable a backup solution to snapshot the guest OSs, ensuring that backups are successful. This quiescence process allows for backups that will not break mission-critical applications like Microsoft SQL Server or Microsoft Exchange. By standardizing on the vSphere platform with a single supported image-based backup solution, ROI is going to be maximized.

Is It a Hybrid Environment?

Hybrid environments are going to have both physical servers and virtual ones. This situation is the trickiest to plan for because it requires a mix of different solutions to address the differing needs of both the physical and virtual platforms.

A recent study shows that only about 4 in 10 servers are virtual. This seems lower than personal experience would dictate, but nonetheless, it illustrates that even the plans to go virtual haven't yet been fully realized. Regardless of the business needs, there are still going to be some physical servers. In a hybrid environment where there are going to be a mix of physical and virtual servers, the ROI calculation is more complex that it is with a virtual-only environment.

Solutions for a hybrid environment must be optimized for the hypervisor and still provide a similar technology set for supporting backup of the physical servers. In both cases, the image-based backup technology underlying either solution should be similar. This makes supportability that much better and more cost effective, which in turn positively impacts ROI. Being able to use a single vendor or a single solution for backup of both physical and virtual servers will drive down the TCO for the solution.

Should All Servers Be Virtual?

The question of whether all servers should be virtual is an important one to answer. As we have previously discussed, there are several advantages to server workloads being virtual. For our purposes, we are going to limit this just to the aspect of backup and recovery.

We have really only identified one type of server that can't appropriately be virtualized; a server with specialized hardware that is not supported. Based on the benefits in terms of supportability, cost savings, and better RTO and RPO values that come from using a single hypervisor will mean that some mechanism for migrating from other hypervisors or physical servers needs to be used.

There are many physical to virtual (P2V) tools that can accomplish the job with varying degrees of success, but the added cost can adversely affect ROI The selected physical to virtual (P2V) and virtual to virtual (V2V) solution will ideally allow unlimited migrations from your current platform into the hypervisor platform.

By combining a backup solution with the ability to migrate to your hypervisor, you get a much higher ROI for the selected solution. Training administrators on a single solution ensures reduced training costs for transitions from P2V. It also helps to ensure greater success in P2V conversions.

Ensuring Scalability

Scalability is one of those terms that almost always seems to imply some form of complexity. This doesn't have to be the case. When selecting a solution for both physical and virtual server backups, the ability to manage the solution from a single pane of glass is going to be critical to getting the best ROI with regard to support costs.

Administrators are increasingly used to being able to employ a single vendor for a particular function. In the backup arena, this means selecting a vendor that can handle backups of all the server workloads in the infrastructure, whether on a variety of different hypervisors or even physical servers, in such a manner that enabled the solution to scale from a single host server to dozens or even hundreds.

With VMware's dominance in the virtual landscape, the ability to back up multiple hypervisors isn't as much of a problem as tackling the multitude of distributed virtual servers in the infrastructure. Using a single interface to manage the backup of virtual servers across the business units will greatly reduce the cost of maintaining a solution.

Using the single interface also ensures that there are no mistaken configurations when performing backups. Settings applied to backups can be easily standardized ensuring that there are no operator errors leading to future problems with restoration. This also means that any changes that are made to the configuration of the backup of the virtual servers can be easily done across the entire business' virtual server landscape in a single location.

Where Do Licensing Model and Philosophy Fit?

One of the key advantages of virtualization is the efficient use of hardware to host many more virtual servers than the traditional single server per piece of hardware model. When choosing how to back up virtual servers, be sure that the licensing model of the solution is the one that fits your consolidated network the best. This means that you should look for a solution that licenses based on the host itself and not the virtual machine count.

For limited amounts of virtual workloads, this may not seem like a big deal, but it really is. Keeping track of licensing and inventory for both physical and virtual servers adds to the cost to support the infrastructure. It can also make licensing compliance a nightmare. The last thing you want is to have the rollout or expansion of your virtual infrastructure reliant on backup licensing problems.

Another key area where cost is often missed is in the licensing and maintenance of the platform on which the virtual backup solution runs. Just when you think you've got all of your licensing worked out, you find out that you need another Windows Server-class system on which to run the backup software. When you are trying to consolidate servers, asking for an additional licensed OS from which to run the backups isn't going to go over well with budgeting.

For small virtual infrastructures, the backup solution should be able to run from a desktop-class system running some flavor of the Windows desktop family. Windows desktops are inexpensive and everywhere. Repurposing a legacy system or even getting a new one is going to be far less expensive than the cost of a server for the same purpose.

For larger organizations, or even for smaller ones that want to have a quick installation, easy setup, and minimal ongoing maintenance, the virtual server backup solution should be available as a preconfigured virtual appliance. Virtual appliances are fantastic for several reasons. Ease of installation, standardized virtual hardware, small footprints, and near-zero variations from environment to environment mean that the appliances are going to be easier to use and easier to support.

Small businesses that are going to be new to virtualization need a solution with a design philosophy that embraces simplicity. Most small businesses aren't going to have the technical expertise to install and maintain complex virtual backup solutions. Virtual backups really don't need to be complex. Sometimes the simplest answer is the best one. Being able to have backups running in less than 15 minutes from the time an installation began is the hallmark of this point.

Complexity is cited as one of the main reasons that businesses aren't properly backing up their virtual infrastructures. It has been estimated that as much as 40 percent of small businesses aren't backing up their virtual servers at all. Those that do regularly back up are around only 15 percent. Other studies show that even when backups do occur, they are infrequent. Anything that can be done to make the process of backing up virtual servers easier to implement and less complex to support and maintain should help to increase the percentages of businesses that properly back up their virtual infrastructures. By choosing a single provider for backup of virtual servers and physical servers with easy-to-use and easy-to-deploy options, you will get not only all of the benefits promised with virtual server backups but also a complete solution to back up for the entire physical infrastructure and a seamless path to a completely virtual one.