ESG SHOWCASE

Modernizing VM Backup at Scale without Compromise—with Dell Technologies

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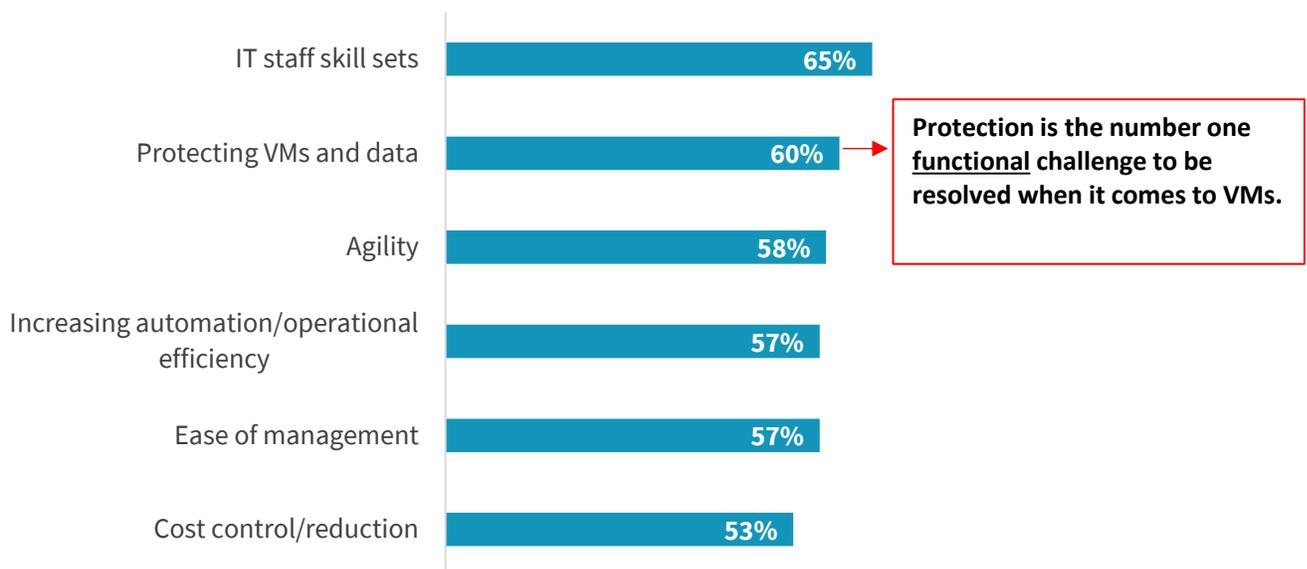
ABSTRACT: VM snapshots have been available for data protection purposes for many years. But until now, alternative approaches amounted to "band aids." They could not meet all the requirements of scaling with performance, forcing organizations to accept tradeoffs. That is why Dell Technologies, based on extensive customer feedback, has developed a new technology that integrates with VMware products called Transparent Snapshots—simplifying the way that rapidly growing VMs can be protected at scale in today's highly transactional, data-intensive workload environments.

Market Landscape

ESG conducted custom research[1] for Dell Technologies to gain a deeper understanding of the challenges that IT professionals face in protecting their on-prem VM environments, whether those environments are rapidly growing or are already very large in size. Findings (see Figure 1) show that data protection has become a major functional pain point related to VM deployments, with multiple data protection mechanisms often being used to protect them.

Figure 1. Top Data Protection Challenges in Large VM Deployments

At the highest level, what pain points or areas of challenge is your organization working to eliminate or reduce when it comes to its existing VM environment? (Percent of respondents, N=300, multiple responses accepted)

Category	Percent
IT staff skill sets	65%
Protecting VMs and data	60%
Agility	58%
Increasing automation/operational efficiency	57%
Ease of management	57%
Cost control/reduction	53%

Protection is the number one <u>functional</u> challenge to be resolved when it comes to VMs.

Source: Enterprise Strategy Group

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[1] Source: ESG Research Insights Paper commissioned by Dell Technologies, *Data Protection Trends in Virtual Environments*, February 2020. All ESG research references and charts in this showcase have been taken from this custom research, unless otherwise noted.

The backup environment itself is the reason many organizations are missing their data protection SLAs. Fifty-three percent of the respondents to this research survey reported that their backup environments are most often the root cause of RTO/RPO failures. Clearly, organizations need to do a better job fixing the avoidable causes behind those missed SLAs.

Although virtualization-specific backup methodologies have been on the market for many years, backup and recovery success is still not a sure thing. Respondents reported that, on average, they can only backup and restore 77% of on-premises VMs successfully (i.e., backups finish without errors, and VMs and associated workloads can be restored).

Disruptive backups can cause significant problems for critical applications and processes across an entire business. Until now, most VM backup technologies have proven to be too limited for large-scale or rapidly growing VM environments. The result is that IT organizations have been forced to accept tradeoffs, which ultimately leads to negative consequences in terms of operational efficiency.

Dell Technologies recognized the obvious need to revisit existing data protection options for VM deployments and developed technology to bridge this gap. The result is improved key performance indicators, reliably protected VMs, and better supported business processes at a real-world level.

Why Traditional VM Backup Methods Fall Short

When VMware first introduced virtual machines, everybody was backing them up using a physical agent-based backup approach. Then, in 2009, VMware came out with VADP (VMware APIs for Data Protection). That advancement enabled image-based backups with dynamic policies.

Since 2009, however, there hadn't been a lot of innovation in regard to protecting VMs. Everybody's still leveraging the same APIs to do image-based backups. This is unfortunate, considering the fact that data in VM-based workloads has grown rampantly.

Some organizations tried to leverage snapshot-based protection via storage array integration, but they still faced challenges related to maintaining acceptable performance at scale. Cost issues and management difficulties arose. Other organizations tried leveraging journaling/continuous data protection (CDP) technologies to meet their tight SLAs. That approach narrowed their operational recovery windows. And of course, CDP can be an expensive process.

The bottom line is that organizations maintaining big or fast-growing VMware environments have trouble backing up large numbers of VMs and large individual VMs. Notably, the mission-critical VMs these organizations are trying to protect with legacy technology such as VADP are predominantly on-premises. Regardless, it makes little sense today to use the same technology that existed more than ten years ago to do backups and still hope to meet SLA windows. It's why organizations have found themselves faced with what seems like an impossible data protection trade off: Either compromise production performance, or give up on meeting established backup-related service-level metrics.

Companies tend to run into backup-window issues when their VM environments grow large … or grow fast. That's because they are now doing lots of deltas (i.e., backing up changed data). Performance issues in the production environment often ensue. The performance-impact problem has become so severe that many organizations have been forced to revert to less-granular agent-based backup, getting away from image-based VADP backup. But then, they lose their dynamic policies. They're essentially back to using an approach not from 2009, but 2003.

That's one of the reasons why it is such a promising development that Dell Technologies has figured out how to help organizations avoid performance impacts to their environments, yet still achieve a remarkably simpler, far less obtrusive way to do image-based backups and granular-level recoveries—*all at a massive scale*.

Introducing Transparent Snapshots: Who Needs It?

Most organizations really should consider leveraging newer VM snapshot technology, especially midmarket organizations that typically have smaller IT staffs. Those organizations have been growing their VM environments at a very fast pace—sometimes doubling the number of VMs every year—and they are encountering issues. Very large organizations with thousands of on-prem VM deployments are also a natural fit and certainly would benefit from a better backup approach.

How It Works

Dell Technologies' approach centers not on an API, but rather on a new ESX plugin called Transparent Snapshots (see Figure 2), available with Dell EMC PowerProtect Data Manager. Certified by VMware, it performs lightweight monitoring of VMs, capturing deltas as they occur. In this manner, when PowerProtect Data Manager asks for a backup, it receives that list of the deltas directly. Basically, because Transparent Snapshots is part of the ESX layer, it directly reads the VMs' disks to obtain those deltas, sending them via plugin directly to PowerProtect appliances.

This is a "no-compromise" solution. The performance benefits of PowerProtect appliances remain available, as Dell Technologies has embedded them in the DD Boost library. And all the benefits of external proxies are part of Transparent Snapshots. Client-side dedupe, compression … it's all part of the data movement occurring inside the ESX plugin.

The result is that all deltas are captured as with a traditional image backup, but without impacting latency or slowing down the application to the point where it would cause a backlog. It has a near-zero impact on VMs and ESX overhead alike. In other words, data is backed up without business disruption.

Best of all, IT doesn't have to do anything regarding managing the deployment. Simplicity is a major hallmark of this solution. It's automatically placed on new ESX hosts without any additional work. No reboot is required on ESX. No maintenance mode either. As VMs are added and need to be protected, Dell Technologies makes sure deployment occurs.

Figure 2. ESX Integration for Transparent Snapshots
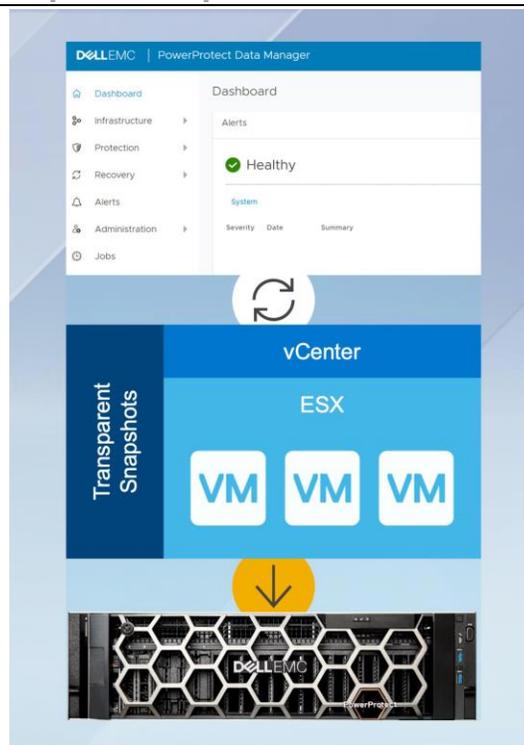
Source: Dell Technologies

This solution also eliminates the need to deal with proxies for data movement. The IT organization does not have to be concerned with how many proxies to deploy when placing a certain number of VMs on an ESX host.

And because of the new, lightweight monitoring, backups happen without impact to VMs or ESX, specifically because of the new, continuous in-memory delta that the solution leverages as part of the plugin.

Transparent Snapshots is both storage agnostic and able to perform at a granular VM level. It does not require IT to buy expensive flash storage to leverage storage-array snaps to get around the performance challenges seen with traditional VADP. Transparent Snapshots is also able to target single VMs for backup—it eliminates the involvement of other VMs, thus avoiding impacts to the entire environment just to protect a single virtual machine. And it features direct data movement to PowerProtect appliances, further enhancing operational efficiency and making SLAs easier to meet.

The Bigger Truth

For years, Dell Technologies has innovated to integrate its data protection solutions with VMware products in order to address the needs of VMware customers. And this integration is particularly unique and highly differentiated. It fundamentally changes the way VM backup is performed, providing performance without disruption, simply—without compromise.

With this solution, you no longer need to settle between performance and capacity: You don't need to worry about backup-related side effects when scaling both performance and capacity at once. That's a benefit, even if you're not yet a large enterprise.

The benefits of this solution abound. They center on increased performance, without negative impact on VMs or ESX hosts when taking a full backup—Dell claims up to 5x faster backups and up to 5x reduced latency on VMs. And the plugin is deployed automatically as part of PowerProtect Data Manager, making scaling easy. Transparent Snapshots is storage agnostic, and it handles orchestration, direct data movement, and more. This is about the simplification of VM backups.

Most things have evolved dramatically since 2009, so why haven't image-based backups? At last, we're seeing this much-needed evolution. Transparent Snapshots is changing the way VMs are backed up by addressing disruption issues (unlike other "solutions," which don't really solve the problem; they just force cost and performance trade-offs). It's the best of both worlds: image-based VM backup at scale, without business disruption. Using Transparent Snapshots is the optimal way to protect VMs.

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