

Transparent Snapshots solves VMware stun challenges like never before

By Andrew Glinka | October 2021

Your VMs are very likely growing in numbers, size, and complexity as you read this.

And not only are they getting bigger and more resource-demanding, but they're also getting more business-critical with each passing day. At the same time, your business-critical apps and data must be continuously available and protected. Anything less and you risk serious operations and business disruption.

As VMs become larger and more complex, backing them up creates significant runtimes and additional overhead when using VADP (VMware API Data Protection) for VMware environments at scale.

That's where our PowerProtect Data Manager Transparent Snapshots' new approach will help solve your disruptive VM stun problem while reducing overhead and runtimes. Specifically, Dell Technologies' internal testing results point to much faster backup times¹ and lower VM snapshot latency². Transparent Snapshots incorporates a data mover from the VMware host directly to target your PowerProtect DD appliance without using VADP or snapping the VMDKs (Virtual Machine Disk).

No other data protection or cloud data management vendor currently has an embedded transparent snapshot data mover mechanism hosted within ESXi that sends VM copies directly to an external data protection appliance.³

Why the traditional way needs a boost to work with today's modern, at scale VMs

Traditional VMware vSphere VADP backup is a proven and established process and works well in typical VM cases and workloads.

There are three basic steps behind taking a traditional VMware vSphere snapshot: 1) snapshot creation; 2) snapshot processing and 3) snapshot sync up and retirement.

However, the fact is, as large and high-performing VMs continue to grow even larger, some inherent aspects of VADP-based snaps create potential real-time performance and latency challenges – including a “stun” while waiting for the above steps to complete.

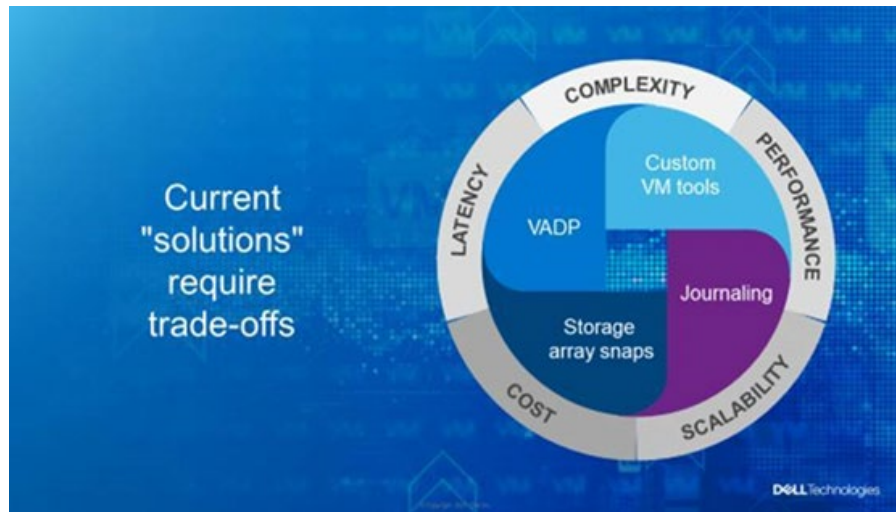
Here are a few examples of the challenges:

- The need for resource-intensive external agents to move VM snapshot data to secondary storage;
- Slow determination (and reconciling) of deltas in the VM dataset and change VMDK writes/tracking, making the halt time for an application longer than desired, before *each* backup and/or recovery;
- Longer application read and write latencies during backup;
- Significant application IOPS reduction during backup; and
- Resulting VM “stunned” mission-critical applications waiting for snaps to complete or get reconciled, thus impacting the customer's operations and business continuity

¹ When comparing PowerProtect Data Manager 19.9 with Transparent Snapshots backup performance to PowerProtect Data Manager with VADP backup performance. Based on Dell Technologies internal testing, August 2021.

² When comparing PowerProtect Data Manager 19.9 with Transparent Snapshots VM latency performance to PowerProtect Data Manager with VADP VM latency performance. Based on Dell Technologies internal testing, August 2021.

³ Based on Dell analysis of publicly available data, August 2021.



Per the above graphic, others have tried to solve this problem with various other snapshot techniques. However, each potential solution has its drawbacks:

VM Technique	Tradeoffs
Custom Vendor VM Tools	Manipulating ESX can affect ESX host operations, which can negatively impact VM performance on the host. Also induces risk as these custom VM tools aren't certified by VMware.
Storage Array VADP Snaps	Treating storage arrays as backup appliances consumes significant resources and can impact/impede thorough data protection operations. And if your primary storage fails, backups are lost.
Journaling	Limited scalability due to high resource requirements. Comes with high local disk requirements, resulting in higher overhead than the actual VM. Not intended or suitable for 'at scale' and complex VM backup.

When using these alternate techniques, performance, latency, efficiency, and stun challenges remain even as traditional VM backup tools are augmented or bypassed. Why? Latency and IOPS issues still occur due to their reliance on external data movers, outside the ESX host.

How Dell Technologies' VMware Transparent Snapshots are Different and "Boosted" above other methods

Included with PowerProtect Data Manager software, Transparent Snapshots significantly streamlines how snapshots are handled for backup and recovery. It has been specifically designed to perform large-scale, complex VM backup and recovery faster. With Dell's Transparent Snapshots, disruptions to business and users due to VM stun and data being unavailable are virtually eliminated.

PowerProtect Data Manager's Transparent Snapshot utility is embedded and hosted within vSphere/ESX. It tracks changes in the VM then sends data *directly* from the ESX host to a PowerProtect DD appliance. It does not rely on an external data mover like other vendor techniques listed above. Rather, our Transparent Snapshots method uses a new vSphere plug-in called the Transparent Snapshots Data Mover (TSDM).

Transparent Snapshots consists of four basic parts. Each run in every step of the VM backup lifecycle – snapshot creation, snapshot processing, and snapshot retirement.

TSDM (i.e., the ‘secret sauce’) contains PowerProtect DD Boost acceleration software, allowing direct data transfer to PowerProtect DD without needing external proxies to move either full-image or incremental data during backups. The new plug-in is installed and deployed just once on the ESX host itself, as part of the VM Image protection workflow.

Since it does not require external agents or temporary directories to be used as part of the VM image backup lifecycle, Transparent Snapshots is faster compared to traditional virtualized ‘at scale’ backups at each step of the lifecycle.¹

“Boost” VM Data Protection with Transparent Snapshots – Only from Dell

Because of this unique in-memory delta change tracking and direct data mover approach, Transparent Snapshots can dramatically speed up your large, resource-hungry virtualized applications and provide backup and restore performance at scale compared to traditional VMware VADP snap methodology.

And by leveraging PowerProtect DD Boost, Transparent Snapshots will greatly minimize the time required to take snaps and reduce costs from reduced resource requirements. It will also minimize user and business disruptions due to stun delays for your critical applications in large-scale virtual environments. A winning combination and innovative approach that is truly unique.

Preliminary internal test results show that Transparent Snapshots can reduce VM latency by up to 5x while delivering up to 5x faster backups^{1, 2}.

	Transparent Snapshots	VADP	Custom VM Tools	Storage array snaps	Journaling
Low latency	●	●	●	●	●
Performance	●	●	●	●	●
Scalability	●	●	●	●	●
Simplicity	●	●	●	●	●
Cost	●	●	●	●	●

Figure 2 – At Scale VM Backups with no compromise

In closing, Dell Technologies’ innovative VMware Transparent Snapshots and TSDM architecture provide the *only* direct ESXi embedded native VM data mover of its kind today. It’s a significant, new ground-breaking tool for VMware environments and data protection. Expect more in-depth product and performance details as well as specific industry differentiators and advantages over other vendors’ VM replication approaches in follow-up posts. Don’t settle for less performance or business disruptions due to other vendors’ workaround techniques and solutions.

In the meantime, ask your Dell Technologies sales rep and partner to show you how our fast and efficient VMware Transparent Snapshots will help ‘ease the stun’ out of your growing, largescale VMware environments.