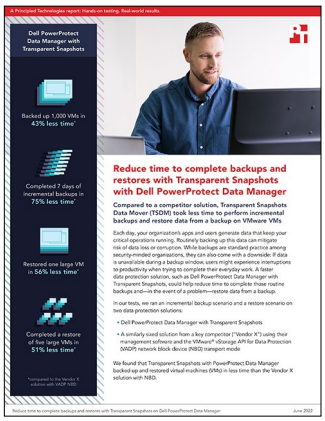

The science behind the report:

Reduce time to complete backups and restores with Transparent Snapshots on Dell PowerProtect Data Manager

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report Reduce time to complete backups and restores with Transparent Snapshots on Dell PowerProtect Data Manager.

We concluded our hands-on testing on May 31, 2022. During testing, we determined the appropriate hardware and software configurations and applied updates as they became available. The results in this report reflect configurations that we finalized on May 31, 2022 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

To learn more about how we have calculated the wins in this report, go to http://facts.pt/calculating-and-highlighting-wins. Unless we state otherwise, we have followed the rules and principles we outline in that document.

Table 1: Summary of the time (in hh:mm:ss) it took to complete backup and restore tasks using the two solutions. Source: Principled Technologies.

Task (hh:mm:ss)	Dell™ PowerProtect Data Manager with TSDM	Vendor X with NBD
Time to back up 1,000 VMs	10:02:51	17:44:54
Time to complete seven days of incremental backups	4:15:32	17:38:15
Time to complete a restore of one large VM to a PowerMax array	00:08:38	00:18:18
Time to complete a restore of one large VM to a PowerStore array	00:09:40	00:22:19
Time to restore five large VMs to a PowerMax array	00:16:37	00:34:32
Time to restore five large VMs to a PowerStore array	00:26:05	00:49:11
Time to complete an incremental backup of one VM	00:19:06	00:37:38
Time to complete an incremental backup of five VMs	00:21:06	00:38:00

Table 2: Minimum, maximum, and average disk activity, in throughput (IOPS) and latency (ms), of a single VM being backed up by each solution. Higher is better for throughput; lower is better for latency. Source: Principled Technologies.

	Dell PowerProtect Data Manager with TSDM	Vendor X with NBD
Latency (ms)		
Minimum	0.292	0.313
Maximum	0.335	2.511
Average	0.305	1.466
Read IOPS		
Minimum	8,673	1,181
Maximum	9,889	9,228
Average	9,471	2,524
Write IOPS		
Minimum	2,884	399
Maximum	3,293	3,078
Average	3,165	844

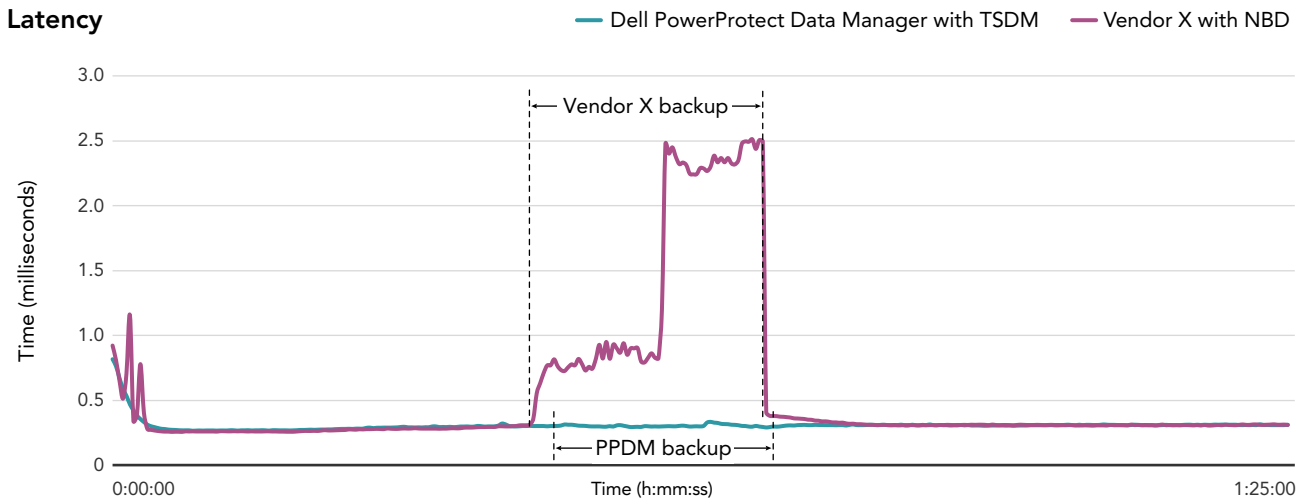

Figure 1: Latency, in milliseconds, for both solutions before, during, and after a backup. Note: These backups did not run concurrently, but are plotted on the same graph for ease of comparison. Lower latency is better. Source: Principled Technologies.

System configuration information

Table 3: Detailed information on the Dell PowerProtect Data Manager solution we tested.

System component information	Dell PowerProtect Data Manager solution
Data protection software	Dell PowerProtect Data Manager
Version	19.10.0-20
Backup transport methods	Transparent Snapshot Data Mover
Backing storage	Dell PowerProtect DD6900
Storage capacity (TB)	185.2
PowerProtect Data Manager platform	
ESXi™ server	Dell PowerEdge™ R740
Processor vendor and model	Intel® Xeon® Gold 6240
Core frequency (GHz)	2.60
Memory module(s)	
Total memory in system (GB)	512
PowerProtect Data Manager virtual machine	
vCPUs	10
RAM (GB)	24
OS	SUSE Linux® Enterprise Server 12 SP5 (x86_64) – Kernel 4.12.14-122.110-default
Disk	7

Table 4: Detailed information on the Vendor X solution we tested.

System component information	Vendor X solution
Capacity (TB)	175.4

How we tested

From our lab at PT, we connected to Windows VM jumpboxes running in a remote lab environment. From within those jumpboxes, we were able to access, verify, and control the lab environment including multiple vSphere™ clusters, virtual machines, and all storage and backup solutions under test. For these efforts, we used either a web-based GUI, SSH connections, or both.

We used the command-line interface of a dedicated Ansible® server that provided orchestration for our tests. We executed scripts to simulate multi-day full and incremental backup solutions, and could define the number of VMs to target, the number of days to execute, and whether ingest occurred incrementally over a series of days or all at once. These scripts performed checks to validate that the VMs were available to be backed up, created and wrote changes to those target VMs, and accessed the backup solutions and storage APIs to both execute backups on policy-defined groups of virtual machines and to collect responses from the solutions under test to capture execution and completion times. We logged all data collected for later analysis.

For backups of VMs, we performed manual full backups before executing incremental backups using similar scripted methods. For performance testing during the backup windows, we captured disk performance metrics using Perfmon to isolate the potential performance impacts a VM experienced. For VM recovery, we utilized a scripted method that collected all data points automatically to ensure consistency across the data collections. We performed the recoveries to two different types of arrays to examine the impact the class of storage (enterprise-level vs. midrange) would have on recovery times.

Read the report at https://facts.pt/4Pf55vZ ▶

This project was commissioned by Dell.

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