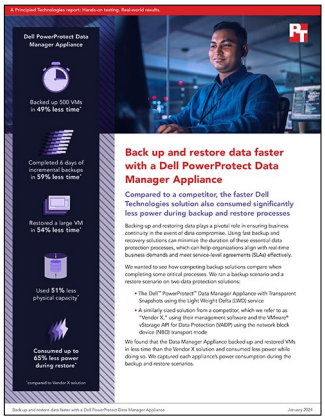

The science behind the report:

Back up and restore data faster with a Dell PowerProtect Data Manager Appliance

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 Back up and restore data faster with a Dell PowerProtect Data Manager Appliance.

We concluded our hands-on testing on September 26, 2023. 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 September 26, 2023 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: Results from our testing of the Dell Technologies and Vendor X solutions. Source: Principled Technologies.

	Dell™ PowerProtect™ Data Manager Appliance with Transparent Snapshots	Vendor X solution with NBD
Time (hh:mm:ss) to back up 500 VMs	9:05:44	17:51:31
Time (hh:mm:ss) to complete six days of incremental backups	6:02:46	14:57:57
Time (hh:mm:ss) to restore one large VM	00:9:44	00:21:31
Time (hh:mm:ss) to restore five large VMs	00:33:59	00:45:57
Used physical capacity (TB) after processing 504 TB of logical data	00:20.17	00:41.45
Total watts consumption while restoring one large VM	6,366	18,257
Total watts consumption while restoring five large VMs	22,258	37,973
Total watts consumption while backing up 500 VMs	40,222	104,188
Average watts consumption while idle during the single large VM restore scenario	505.64	723.75
Average watts consumption while idle during the five large VM restore scenario	521.16	692.26
Average watts consumption while idle during the 500 large VM backup scenario	525.57	708.4

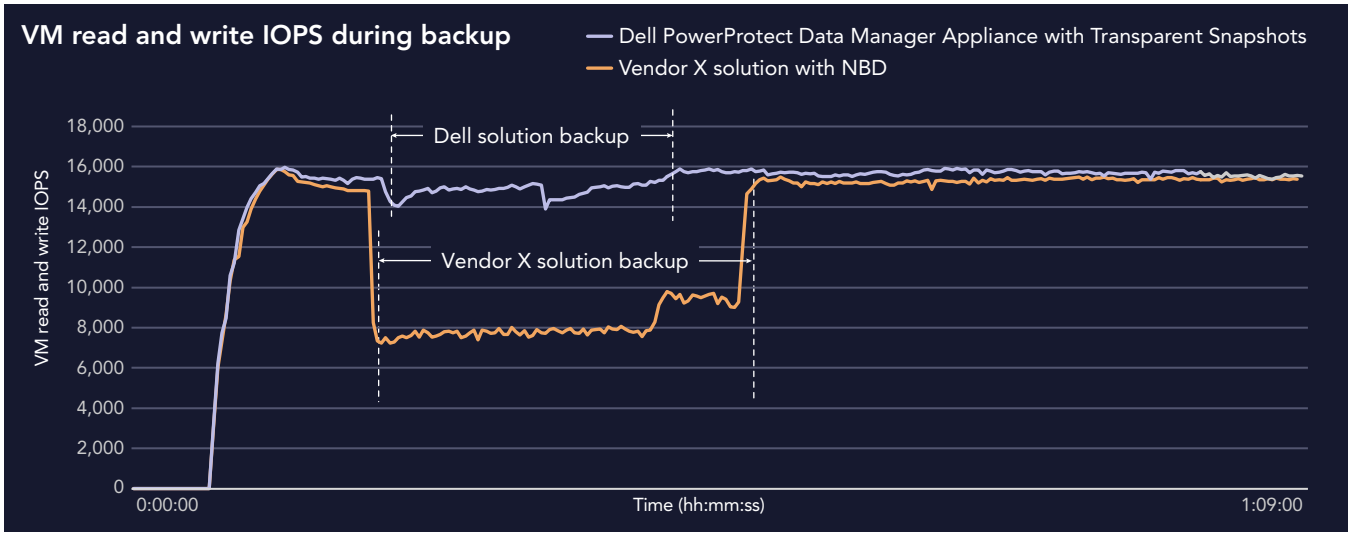

Figure 13: IOPS on the single VM for both solutions before, during, and after a backup and while running a DISKSPD workload. Note: These backups did not run concurrently, but we plotted them on the same graph for ease of comparison. Higher is better. Source: Principled Technologies.

System configuration information

Table 2: Detailed information on the Dell PowerProtect Data Manager Appliance we tested.

System component information	Dell PowerProtect Data Manager Appliance
Data protection software	Dell PowerProtect Data Manager
Backup transport methods	Transparent Snapshot Data Mover with Light Weight Delta (LWD)
Backing storage	Dell Data Domain Virtual Edition
Storage capacity (TB)	95.3
PowerProtect Data Manager Appliance	
VMware ESXi™ server	7.0 Update 3-050 (Dell-EMC)
Processor vendor and model	Intel® Xeon® Gold 5218R
Core frequency (GHz)	2.10
Memory module(s)	
Total memory in system (GB)	384
PowerProtect Data Manager virtual machine	
vCPUs	14
RAM (GB)	32
OS	SUSE Linux® Enterprise Server 12 SP5 (x86_64) – Kernel 4.12.14-122.133-default
Disk	7

Table 3: Detailed information on the Vendor X solution we tested.

System component information	Vendor X solution
Capacity (TB)	96.4

How we tested

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

For our performance tests, we used the command line interface of a dedicated Ansible® server that provided orchestration. We executed scripts to simulate full and incremental backup solutions and could set the number of VMs. These scripts performed checks to validate that the solutions could back up and create VMs and write changes to those VMs. The scripts also verified that the VMs could access the backup solutions and storage APIs to execute backups on policy-defined groups of VMs and to collect responses from the solutions under test to capture execution and completion times. We logged all collected data for analysis.

For backups of VMs, we performed a full backup before executing incremental backups using similar scripted methods. For performance testing during the backup windows, we used PerfMon to capture disk performance metrics and isolate potential performance impacts a VM experienced. For VM recovery, we used a script that collected all data points automatically to ensure consistency across the data collections.

For our power consumptions tests measured power consumption by connecting each solution to a pair of redundant smart power distribution units (PDUs) and isolating those PDUs from any other devices. We configured the smart PDUs to send power consumption data to a centralized server for data collection. We captured power consumption metrics for both idle states and during test execution. We then logged into the web interface of the centralized data collection server and exported the average power consumption over the duration of the test into a CSV file for reporting purposes.

View the original, English version of this report at https://facts.pt/ju7BxdN

Read the report ▶

This project was commissioned by Dell Technologies.

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