



The science behind the report:

Increase performance, lower latency, and store data more efficiently with the Dell PowerStore 9500 array

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 [Increase performance, lower latency, and store data more efficiently with the Dell PowerStore 9500 array](#).

We concluded our hands-on testing on April 17, 2026. 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 April 15, 2026 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 <https://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 of our testing.

	Dell PowerStore 9500	Vendor A	Dell advantage
Data reduction ratio (higher is better)	6.6:1	2.76:1	2.39x
Average IOPS (higher is better)	834,558.4	357,427.3	2.33x
Average latency (ms, lower is better)	0.441	1.223	63.9% less time
Minimum latency (ms, lower is better)	0.397	0.438	-
Maximum latency (ms, lower is better)	0.586	15.214	-

System configuration information

Table 2: Detailed information on the systems we tested.

System configuration information	Dell PowerStore 9500 VM hosts Dell PowerEdge R740	Vendor A VM hosts Dell PowerEdge R740
BIOS name and version	Dell A1.0	Dell A1.0
Non-default BIOS settings	Intel® Turbo Boost enabled, Virtualization enabled	Intel Turbo Boost enabled, Virtualization enabled
Operating system name and version/build number	VMware ESXi, 8.0.3 24859861	VMware ESXi, 8.0.3 24859861
Date of last OS updates/patches applied	03/01/2026	03/01/2026
Power management policy	Performance	Performance
Processor		
Number of processors	2	2
Vendor and model	Intel Xeon Gold 6126	Intel Xeon Gold 6252
Core count (per processor)	12	24
Core frequency (GHz)	2.60	2.10
Memory module(s)		
Total memory in system (GB)	256	256
Number of memory modules	16	16
Vendor and model	Hynix® HG4894829485757320X	Hynix HG4894829485757320X
Size (GB)	8	8
Type	PC4-17000	PC4-17000
Speed (MHz)	2,133	2,133
Speed running in the server (MHz)	2,133	2,133
Storage controller		
Vendor and model	Dell PERC H740p	Dell PERC H730p
Cache size (GB)	2	2
Firmware version	1.0	1.0
Driver version	1.0.1	1.0.1
Storage controller		
Vendor and model	Emulex® LPe35000/LPe36000 Fibre Channel Adapter	Emulex LPe35000/LPe36000 Fibre Channel Adapter
Firmware version	1.0	1.0
Local storage		
Number of drives	1	1
Drive vendor and model	Seagate® SST900587	Seagate SST900587
Drive size (TB)	1.75	3.49
Drive information (speed, interface, type)	15K, 12Gb SAS, HDD	15K, 12Gb SAS, HDD

System configuration information	Dell PowerStore 9500 VM hosts Dell PowerEdge R740	Vendor A VM hosts Dell PowerEdge R740
Network adapter		
Vendor and model	Intel X540	Intel X540
Number and type of ports	2 x 10GbE	2 x 10GbE
Driver version	1.0.1	1.0.1
Cooling fans		
Vendor and model	Dell A1234	Dell A1234
Number of cooling fans	5	5
Power supplies		
Vendor and model	Dell A5678	Dell A5678
Number of power supplies	2	2
Wattage of each (W)	750	750

Table 3: Detailed configuration information for the storage solution.

Storage configuration information	Dell PowerStore 9500	Vendor A
Number of storage controllers	2	2
Number of storage shelves	1	1
Number of drives per shelf	24	32
Drive size (TB)	3.5	3.5
Drive information (speed, interface, type)	NVMe SSD	NVMe SSD

How we tested

Dell granted us remote access into a datacenter where the test setup resided. Each cluster contained either (1) four Dell PowerEdge R740 servers with VMware ESXi 8.0 U3 with two Intel Xeon Gold 6126 processors, 256 GB of RAM, an Emulex LPe35000/36000 Fibre Channel adapter, and a dual-port 10GbE network adapter, or (2) four Dell PowerEdge R730p servers with Xeon Gold 6252 processors, 256 GB of RAM, an Emulex LPe35000/36000 Fibre Channel adapter, and a dual-port 10GbE network adapter. Each cluster was managed by the same vCenter 8.0 server.

Once we received IP addresses for all physical and virtual components, we verified that the setups on both testbeds were identical where possible, and configured as closely as possible where an identical configuration wasn't achievable. For example, the available systems in the lab were consistent within each cluster, and contained identical amounts of RAM, the same Fibre Channel adapters, and same network adapters. We noted in the hardware disclosure that while both systems utilized Intel Gold processors, the R730 series processors possessed a higher core count but lower core frequency.

After completing the verification process, we moved into testing. We began by creating 64 x 300GB volumes on the PowerStore cluster, which we mapped as RDM disks in vSphere to the 16 VMs contained within the dedicated cluster for PowerStore testing. For Vendor A, we created 64 x 300GB LUNs and mapped those as RDM disks in vSphere to the 16 VMs contained within that dedicated cluster.

We started each of our set of tests by pre-filling the volumes with Vdbench, with a compression ratio of 2:1 and deduplication ratio of 2.5:1. We then waited for 1 hour after each test and captured the DRR as reported by each array. Next, we executed a mixed workload to simulate OLTP with Analytics traffic. Then, we executed three targeted IOPS tests to capture the latency of each solution. We performed this set of tests three times on each platform and report the median run data reduction ratio of each cluster.

Performance tests

Volume data pre-fill

We used 256KB sequential writes with single thread to fill the LUNs with data.

```
compratio=2
dedupratio=2.5
dedupunit=8k
dedupsets=5%

messagescan=no

hd=default,shell=ssh,user=root
hd=hd1,system=PS_001
hd=hd2,system=PS_002
hd=hd3,system=PS_003
hd=hd4,system=PS_004
hd=hd5,system=PS_005
hd=hd6,system=PS_006
hd=hd7,system=PS_007
hd=hd8,system=PS_008
hd=hd9,system=PS_009
hd=hd10,system=PS_010
hd=hd11,system=PS_011
hd=hd12,system=PS_012
hd=hd13,system=PS_013
hd=hd14,system=PS_014
hd=hd15,system=PS_015
hd=hd16,system=PS_016

sd=default,openflags=o_direct
sd=sd1,hd=hd1,lun=/dev/sdb
sd=sd2,hd=hd1,lun=/dev/sdc
sd=sd3,hd=hd1,lun=/dev/sdd
sd=sd4,hd=hd1,lun=/dev/sde

sd=sd5,hd=hd2,lun=/dev/sdb
sd=sd6,hd=hd2,lun=/dev/sdc
sd=sd7,hd=hd2,lun=/dev/sdd
sd=sd8,hd=hd2,lun=/dev/sde

sd=sd9,hd=hd3,lun=/dev/sdb
sd=sd10,hd=hd3,lun=/dev/sdc
sd=sd11,hd=hd3,lun=/dev/sdd
```

```
sd=sd12,hd=hd3,lun=/dev/sde

sd=sd13,hd=hd4,lun=/dev/sdb
sd=sd14,hd=hd4,lun=/dev/sdc
sd=sd15,hd=hd4,lun=/dev/sdd
sd=sd16,hd=hd4,lun=/dev/sde

sd=sd17,hd=hd5,lun=/dev/sdb
sd=sd18,hd=hd5,lun=/dev/sdc
sd=sd19,hd=hd5,lun=/dev/sdd
sd=sd20,hd=hd5,lun=/dev/sde

sd=sd21,hd=hd6,lun=/dev/sdb
sd=sd22,hd=hd6,lun=/dev/sdc
sd=sd23,hd=hd6,lun=/dev/sdd
sd=sd24,hd=hd6,lun=/dev/sde

sd=sd25,hd=hd7,lun=/dev/sdb
sd=sd26,hd=hd7,lun=/dev/sdc
sd=sd27,hd=hd7,lun=/dev/sdd
sd=sd28,hd=hd7,lun=/dev/sde

sd=sd29,hd=hd8,lun=/dev/sdb
sd=sd30,hd=hd8,lun=/dev/sdc
sd=sd31,hd=hd8,lun=/dev/sdd
sd=sd32,hd=hd8,lun=/dev/sde

sd=sd33,hd=hd9,lun=/dev/sdb
sd=sd34,hd=hd9,lun=/dev/sdc
sd=sd35,hd=hd9,lun=/dev/sdd
sd=sd36,hd=hd9,lun=/dev/sde

sd=sd37,hd=hd10,lun=/dev/sdb
sd=sd38,hd=hd10,lun=/dev/sdc
sd=sd39,hd=hd10,lun=/dev/sdd
sd=sd40,hd=hd10,lun=/dev/sde

sd=sd41,hd=hd11,lun=/dev/sdb
sd=sd42,hd=hd11,lun=/dev/sdc
sd=sd43,hd=hd11,lun=/dev/sdd
sd=sd44,hd=hd11,lun=/dev/sde

sd=sd45,hd=hd12,lun=/dev/sdb
sd=sd46,hd=hd12,lun=/dev/sdc
sd=sd47,hd=hd12,lun=/dev/sdd
sd=sd48,hd=hd12,lun=/dev/sde

sd=sd49,hd=hd13,lun=/dev/sdb
sd=sd50,hd=hd13,lun=/dev/sdc
sd=sd51,hd=hd13,lun=/dev/sdd
sd=sd52,hd=hd13,lun=/dev/sde

sd=sd53,hd=hd14,lun=/dev/sdb
sd=sd54,hd=hd14,lun=/dev/sdc
sd=sd55,hd=hd14,lun=/dev/sdd
sd=sd56,hd=hd14,lun=/dev/sde

sd=sd57,hd=hd15,lun=/dev/sdb
sd=sd58,hd=hd15,lun=/dev/sdc
sd=sd59,hd=hd15,lun=/dev/sdd
sd=sd60,hd=hd15,lun=/dev/sde

sd=sd61,hd=hd16,lun=/dev/sdb
sd=sd62,hd=hd16,lun=/dev/sdc
sd=sd63,hd=hd16,lun=/dev/sdd
sd=sd64,hd=hd16,lun=/dev/sde

wd=default,sd=*
wd=wd_prefill,sd=sd*,xfersize=256k,seekpct=eof,rdpct=0

rd=default
rd=rd_prefill,wd=wd_prefill,elapsed=10h,interval=10,iorate=max,forthreads=(1)
```

OLTPA mixed workloads

We used the same pre-filled volumes and executed vdbench using a mix of read heavy 8k IOs with 128k sequential large reads and writes to mimic index and table scans, batch queries, and background analytics.

```
compratio=2
dedupratio=2.5
dedupunit=8k
dedupsets=5%

messagescan=no

hd=default,shell=ssh,user=root
hd=hd1,system=PS_001
hd=hd2,system=PS_002
hd=hd3,system=PS_003
hd=hd4,system=PS_004
hd=hd5,system=PS_005
hd=hd6,system=PS_006
hd=hd7,system=PS_007
hd=hd8,system=PS_008
hd=hd9,system=PS_009
hd=hd10,system=PS_010
hd=hd11,system=PS_011
hd=hd12,system=PS_012
hd=hd13,system=PS_013
hd=hd14,system=PS_014
hd=hd15,system=PS_015
hd=hd16,system=PS_016

sd=default,openflags=o_direct
sd=sd1,hd=hd1,lun=/dev/sdb
sd=sd2,hd=hd1,lun=/dev/sdc
sd=sd3,hd=hd1,lun=/dev/sdd
sd=sd4,hd=hd1,lun=/dev/sde

sd=sd5,hd=hd2,lun=/dev/sdb
sd=sd6,hd=hd2,lun=/dev/sdc
sd=sd7,hd=hd2,lun=/dev/sdd
sd=sd8,hd=hd2,lun=/dev/sde

sd=sd9,hd=hd3,lun=/dev/sdb
sd=sd10,hd=hd3,lun=/dev/sdc
sd=sd11,hd=hd3,lun=/dev/sdd
sd=sd12,hd=hd3,lun=/dev/sde

sd=sd13,hd=hd4,lun=/dev/sdb
sd=sd14,hd=hd4,lun=/dev/sdc
sd=sd15,hd=hd4,lun=/dev/sdd
sd=sd16,hd=hd4,lun=/dev/sde

sd=sd17,hd=hd5,lun=/dev/sdb
sd=sd18,hd=hd5,lun=/dev/sdc
sd=sd19,hd=hd5,lun=/dev/sdd
sd=sd20,hd=hd5,lun=/dev/sde

sd=sd21,hd=hd6,lun=/dev/sdb
sd=sd22,hd=hd6,lun=/dev/sdc
sd=sd23,hd=hd6,lun=/dev/sdd
sd=sd24,hd=hd6,lun=/dev/sde

sd=sd25,hd=hd7,lun=/dev/sdb
sd=sd26,hd=hd7,lun=/dev/sdc
sd=sd27,hd=hd7,lun=/dev/sdd
sd=sd28,hd=hd7,lun=/dev/sde

sd=sd29,hd=hd8,lun=/dev/sdb
sd=sd30,hd=hd8,lun=/dev/sdc
```

```
sd=sd31,hd=hd8,lun=/dev/sdd
sd=sd32,hd=hd8,lun=/dev/sde
```

```
sd=sd33,hd=hd9,lun=/dev/sdb
sd=sd34,hd=hd9,lun=/dev/sdc
sd=sd35,hd=hd9,lun=/dev/sdd
sd=sd36,hd=hd9,lun=/dev/sde
```

```
sd=sd37,hd=hd10,lun=/dev/sdb
sd=sd38,hd=hd10,lun=/dev/sdc
sd=sd39,hd=hd10,lun=/dev/sdd
sd=sd40,hd=hd10,lun=/dev/sde
```

```
sd=sd41,hd=hd11,lun=/dev/sdb
sd=sd42,hd=hd11,lun=/dev/sdc
sd=sd43,hd=hd11,lun=/dev/sdd
sd=sd44,hd=hd11,lun=/dev/sde
```

```
sd=sd45,hd=hd12,lun=/dev/sdb
sd=sd46,hd=hd12,lun=/dev/sdc
sd=sd47,hd=hd12,lun=/dev/sdd
sd=sd48,hd=hd12,lun=/dev/sde
```

```
sd=sd49,hd=hd13,lun=/dev/sdb
sd=sd50,hd=hd13,lun=/dev/sdc
sd=sd51,hd=hd13,lun=/dev/sdd
sd=sd52,hd=hd13,lun=/dev/sde
```

```
sd=sd53,hd=hd14,lun=/dev/sdb
sd=sd54,hd=hd14,lun=/dev/sdc
sd=sd55,hd=hd14,lun=/dev/sdd
sd=sd56,hd=hd14,lun=/dev/sde
```

```
sd=sd57,hd=hd15,lun=/dev/sdb
sd=sd58,hd=hd15,lun=/dev/sdc
sd=sd59,hd=hd15,lun=/dev/sdd
sd=sd60,hd=hd15,lun=/dev/sde
```

```
sd=sd61,hd=hd16,lun=/dev/sdb
sd=sd62,hd=hd16,lun=/dev/sdc
sd=sd63,hd=hd16,lun=/dev/sdd
sd=sd64,hd=hd16,lun=/dev/sde
```

```
wd=wd_OLTP2A_RRH,sd=*,rdpct=100,rhpct=100,xfersize=8K,skew=20
wd=wd_OLTP2A_RRM,sd=*,rdpct=100,xfersize=8k,skew=45
wd=wd_OLTP2A_RWW,sd=*,rdpct=0,xfersize=8K,skew=10
wd=wd_OLTP2A_RWH,sd=*,rdpct=0,whpct=100,xfersize=8K,skew=5
wd=wd_OLTP2A_SR,sd=*,rdpct=100,seekpct=0.001,xfersize=128K,skew=10
wd=wd_OLTP2A_SW,sd=*,rdpct=0,seekpct=0.001,xfersize=128K,skew=10
```

```
rd=rd0,wd=(wd_OLTP2A_RRH,wd_OLTP2A_RRM,wd_OLTP2A_RWW,wd_OLTP2A_RWH,wd_OLTP2A_SR,wd_OLTP2A_SW),iorate=max
,interval=1,elapsed=270,forthreads=(2,4,8,12,16,20,24,28),warmup=30
```

Latency testing

For these tests we used the existing pre-filled volumes, and set a targeted IOPS rate with Mixed los, and ran the test for 10 minutes, with a 30 second warmup. We ran the latency test three times, with a 10 minute pause between each test.

```
compratio=2
dedupratio=2.5
dedupunit=8k
dedupsets=5%

messagescan=no

hd=default,shell=ssh,user=root
hd=hd1,system=PS_001
hd=hd2,system=PS_002
hd=hd3,system=PS_003
hd=hd4,system=PS_004
hd=hd5,system=PS_005
hd=hd6,system=PS_006
hd=hd7,system=PS_007
hd=hd8,system=PS_008
hd=hd9,system=PS_009
hd=hd10,system=PS_010
hd=hd11,system=PS_011
hd=hd12,system=PS_012
hd=hd13,system=PS_013
hd=hd14,system=PS_014
hd=hd15,system=PS_015
hd=hd16,system=PS_016

sd=default,openflags=o_direct
sd=sd1,hd=hd1,lun=/dev/sdb
sd=sd2,hd=hd1,lun=/dev/sdc
sd=sd3,hd=hd1,lun=/dev/sdd
sd=sd4,hd=hd1,lun=/dev/sde

sd=sd5,hd=hd2,lun=/dev/sdb
sd=sd6,hd=hd2,lun=/dev/sdc
sd=sd7,hd=hd2,lun=/dev/sdd
sd=sd8,hd=hd2,lun=/dev/sde

sd=sd9,hd=hd3,lun=/dev/sdb
sd=sd10,hd=hd3,lun=/dev/sdc
sd=sd11,hd=hd3,lun=/dev/sdd
sd=sd12,hd=hd3,lun=/dev/sde

sd=sd13,hd=hd4,lun=/dev/sdb
sd=sd14,hd=hd4,lun=/dev/sdc
sd=sd15,hd=hd4,lun=/dev/sdd
sd=sd16,hd=hd4,lun=/dev/sde

sd=sd17,hd=hd5,lun=/dev/sdb
sd=sd18,hd=hd5,lun=/dev/sdc
sd=sd19,hd=hd5,lun=/dev/sdd
sd=sd20,hd=hd5,lun=/dev/sde

sd=sd21,hd=hd6,lun=/dev/sdb
sd=sd22,hd=hd6,lun=/dev/sdc
sd=sd23,hd=hd6,lun=/dev/sdd
sd=sd24,hd=hd6,lun=/dev/sde

sd=sd25,hd=hd7,lun=/dev/sdb
sd=sd26,hd=hd7,lun=/dev/sdc
sd=sd27,hd=hd7,lun=/dev/sdd
sd=sd28,hd=hd7,lun=/dev/sde

sd=sd29,hd=hd8,lun=/dev/sdb
sd=sd30,hd=hd8,lun=/dev/sdc
```

```
sd=sd31,hd=hd8,lun=/dev/sdd
sd=sd32,hd=hd8,lun=/dev/sde
```

```
sd=sd33,hd=hd9,lun=/dev/sdb
sd=sd34,hd=hd9,lun=/dev/sdc
sd=sd35,hd=hd9,lun=/dev/sdd
sd=sd36,hd=hd9,lun=/dev/sde
```

```
sd=sd37,hd=hd10,lun=/dev/sdb
sd=sd38,hd=hd10,lun=/dev/sdc
sd=sd39,hd=hd10,lun=/dev/sdd
sd=sd40,hd=hd10,lun=/dev/sde
```

```
sd=sd41,hd=hd11,lun=/dev/sdb
sd=sd42,hd=hd11,lun=/dev/sdc
sd=sd43,hd=hd11,lun=/dev/sdd
sd=sd44,hd=hd11,lun=/dev/sde
```

```
sd=sd45,hd=hd12,lun=/dev/sdb
sd=sd46,hd=hd12,lun=/dev/sdc
sd=sd47,hd=hd12,lun=/dev/sdd
sd=sd48,hd=hd12,lun=/dev/sde
```

```
sd=sd49,hd=hd13,lun=/dev/sdb
sd=sd50,hd=hd13,lun=/dev/sdc
sd=sd51,hd=hd13,lun=/dev/sdd
sd=sd52,hd=hd13,lun=/dev/sde
```

```
sd=sd53,hd=hd14,lun=/dev/sdb
sd=sd54,hd=hd14,lun=/dev/sdc
sd=sd55,hd=hd14,lun=/dev/sdd
sd=sd56,hd=hd14,lun=/dev/sde
```

```
sd=sd57,hd=hd15,lun=/dev/sdb
sd=sd58,hd=hd15,lun=/dev/sdc
sd=sd59,hd=hd15,lun=/dev/sdd
sd=sd60,hd=hd15,lun=/dev/sde
```

```
sd=sd61,hd=hd16,lun=/dev/sdb
sd=sd62,hd=hd16,lun=/dev/sdc
sd=sd63,hd=hd16,lun=/dev/sdd
sd=sd64,hd=hd16,lun=/dev/sde
```





```
wd=wd_OLTP2A_RRH,sd=*,rdpct=100,rhpct=100,xfersize=8K,skew=20
wd=wd_OLTP2A_RRM,sd=*,rdpct=100,xfersize=8k,skew=45
wd=wd_OLTP2A_RWW,sd=*,rdpct=0,xfersize=8K,skew=10
wd=wd_OLTP2A_RWH,sd=*,rdpct=0,whpct=100,xfersize=8K,skew=5
wd=wd_OLTP2A_SR,sd=*,rdpct=100,seekpct=0.001,xfersize=128K,skew=10
wd=wd_OLTP2A_SW,sd=*,rdpct=0,seekpct=0.001,xfersize=128K,skew=10
```

```
rd=rd1,wd=(wd_OLTP2A_RRH,wd_OLTP2A_RRM,wd_OLTP2A_RWW,wd_OLTP2A_RWH,wd_OLTP2A_SR,wd_OLTP2A_SW),iorate=310000,interval=1,elapsed=600,forthreads=(32),warmup=30
```

This project was commissioned by Dell Technologies.

[Read the report](#) ▶

Primary contributors

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-  **Writing:** Laura W.
-  **Design:** Laura K., Emily B.
-  **PM:** Scott Luchene

How we created this report

A PT team, which includes the contributors we've listed and others, created this report and performed the technical work behind it. We used AI to *[find sources, draft an outline of the report, and format citations, and some of the stock images are AI-generated]*.



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