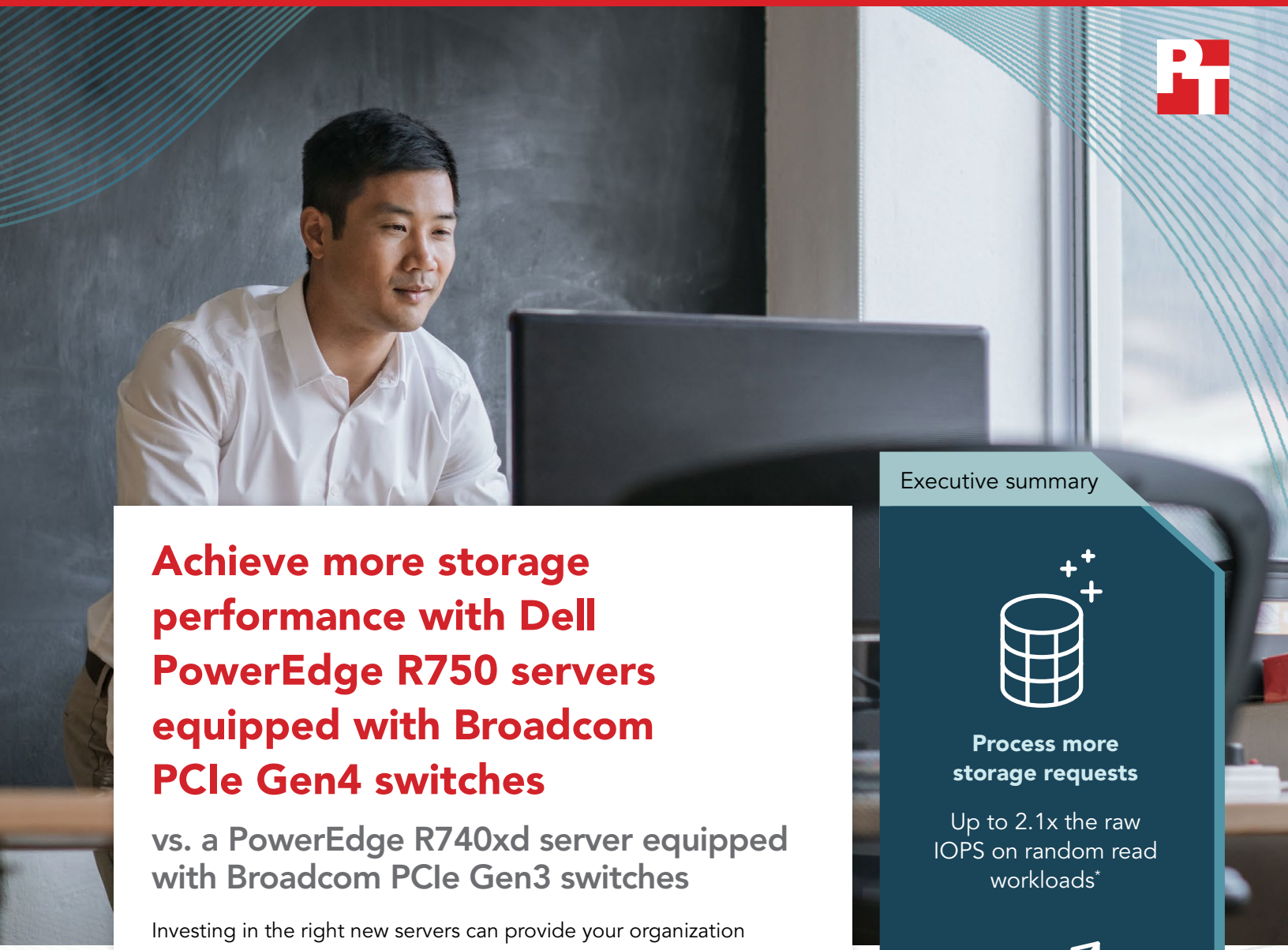

Achieve more storage performance with Dell PowerEdge R750 servers equipped with Broadcom PCIe Gen4 switches

vs. a PowerEdge R740xd server equipped with Broadcom PCIe Gen3 switches

Investing in the right new servers can provide your organization with the resources it needs to grow business and keep customers happy. The Dell PowerEdge™ R750 server comes equipped with the Broadcom PCIe® Gen 4.0 ExpressFabric Platform, which delivers latest-gen features and benefits that have the potential to help you accelerate data transfer speeds.

To understand the data transfer speed advantages of the 15G Dell PowerEdge R750 server with PCIe Gen4 switches, we compared its input/output operations per second (IOPS) and throughput to those of a previous-gen Dell PowerEdge R740xd server with Broadcom PCIe Gen3 switches.

In our tests, the Dell PowerEdge R750 server with PCIe Gen4 switches processed over 6.5M more random read IOPS and sustained over twice the gibibytes per second (GiB/s) on a 1MB sequential read workload compared to a previous-generation PowerEdge R740xd server with PCIe Gen3 switches.

Executive summary

Process more storage requests

Up to 2.1x the raw IOPS on random read workloads*

Sustain more concurrent throughput

Up to 2.2x the GiB/s on sequential read workloads*

Up to 1.9x the GiB/s on sequential write workloads*

*compared to a PowerEdge R740xd server with Broadcom PCIe Gen3 switches

How we tested

We compared the server and storage switch performance of a Dell PowerEdge R750 equipped with the new Dell PEX88000 series switch, which is a Broadcom PCIe Gen4 switched topology storage adapter, to that of a Dell PowerEdge R740xd, equipped with a Broadcom PCIe Gen3 switch (Dell PEX 9733). Both solutions were dual-processor, and each processor controlled a single switch. To measure each solution's block storage performance, we captured Flexible input/output (FIO) benchmark performance metrics.

Performance and scalability

Running 4KB random read and write workloads as well as 1MB sequential read and write workloads provides an overarching view of how each solution handles the transfer of different data types and sizes. To determine each solution's scalability, we also gathered 8, 16, and 36 (plus 56 for the PowerEdge R750) core performance metrics for both server solutions in configurations with 8, 12, and 24 NVMe drives. Here we show results from the configuration with 24 NVMe drives.

Process more outgoing storage requests

Random read FIO results with 24 NVMe drives

IOPS | Higher is better

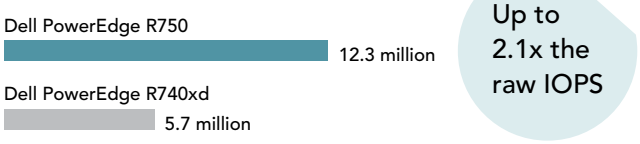

Figure 1: Random read FIO benchmark results on 24 NVMe drives with 56 cores for the PowerEdge R750 and 36 cores for the PowerEdge R740xd. Higher is better. Source: Principled Technologies.

Process more incoming storage requests

Random write FIO results with 24 NVMe drives

IOPS | Higher is better

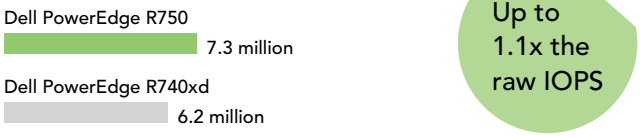

Figure 2: Random write FIO benchmark results on 24 NVMe drives with 56 cores for the PowerEdge R750 and 36 cores for the PowerEdge R740xd. Higher is better. Source: Principled Technologies.

Sustain more outgoing concurrent throughput

Sequential read FIO benchmark results with 24 NVMe drives

Throughput | Higher is better

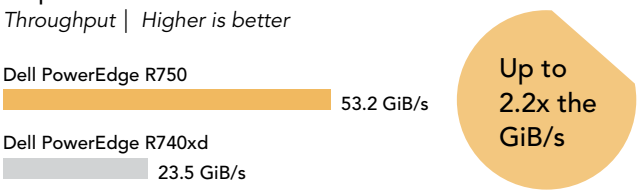

Figure 3: Sequential read FIO benchmark results on 24 NVMe drives with 56 cores for the PowerEdge R750 and 36 cores for the PowerEdge R740xd. Higher is better. Source: Principled Technologies.

Sustain more incoming concurrent throughput

Sequential write FIO benchmark results with 24 NVMe drives

Throughput | Higher is better

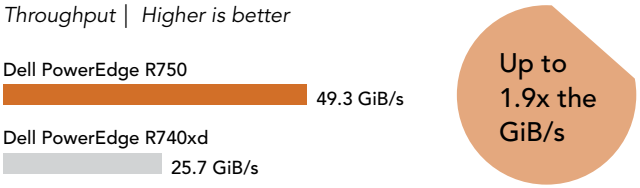

Figure 4: Sequential write FIO benchmark results on 24 NVMe drives with 56 cores for the PowerEdge R750 and 36 cores for the PowerEdge R740xd. Higher is better. Source: Principled Technologies.

We found that the Dell PowerEdge R750 server with PCIe Gen4 switches processed significantly more storage requests and sustained more concurrent throughput both to and from storage than the Dell PowerEdge R740xd server with PCIe Figure Gen3 switches.

Read the report at https://facts.pt/yjZGZ6O ▶

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