Research Abstract

PROWESS

NVMe® RAID Controllers Offer Performance Gains with Reliability for Critical Applications

Prowess Consulting benchmark tests on Dell™ PowerEdge™ servers demonstrate how NVMe RAID controllers help organizations meet the needs of demanding workloads.

Bare-metal deployments offer an obvious solution for maximizing performance of demanding workloads, like analytics, artificial intelligence (AI), machine learning (ML), and high-performance computing (HPC). But a bare metal deployment might not be a viable option if it relies on slower Serial Attached SCSI (SAS)–based or Serial ATA (SATA)-based RAID controllers that can add latency.

NVMe RAID Brings Significant Performance Gains

Newer NVM Express® (NVMe®)-based RAID controllers can help solve this performance dilemma by overcoming the latency gaps caused by the slower SAS protocol.

Testing by Prowess Consulting showed that Dell™ PowerEdge™ R750 servers, built with newer Dell™ PowerEdge RAID Controller 11 (PERC 11) NVMe RAID controllers, can significantly boost performance for critical workloads while still ensuring the high levels of reliability that businesses require.

In our testing, a Microsoft® SQL Server® workload running on a single PowerEdge R750 server with NVMe RAID showed a 2.92x increase in database transaction performance, compared to a PowerEdge R740xd server configured with Dell PERC 10 controllers using SATA SSDs.[1]

A Dell™ PowerEdge™ R750 server with NVM Express® (NVMe®) RAID controllers, compared to a PowerEdge R740xd server with SATA RAID controllers, demonstrated:

Up to

2.92x

greater database transaction performance[1]

Database Workload

We used SQL Server for testing because this application is commonly used with data-intensive workloads that require top performance for businesses and their customers. For this testing, we used BenchCraft, a Microsoft benchmarking tool that processes data like a TPC-C® benchmark.[2]

As Figure 1 shows, our testing revealed a significant jump in performance when running a SQL Server workload on the bare-metal PowerEdge R750 server with an NVMe RAID array, compared to a similar workload on the PowerEdge R740xd with a SATA array.

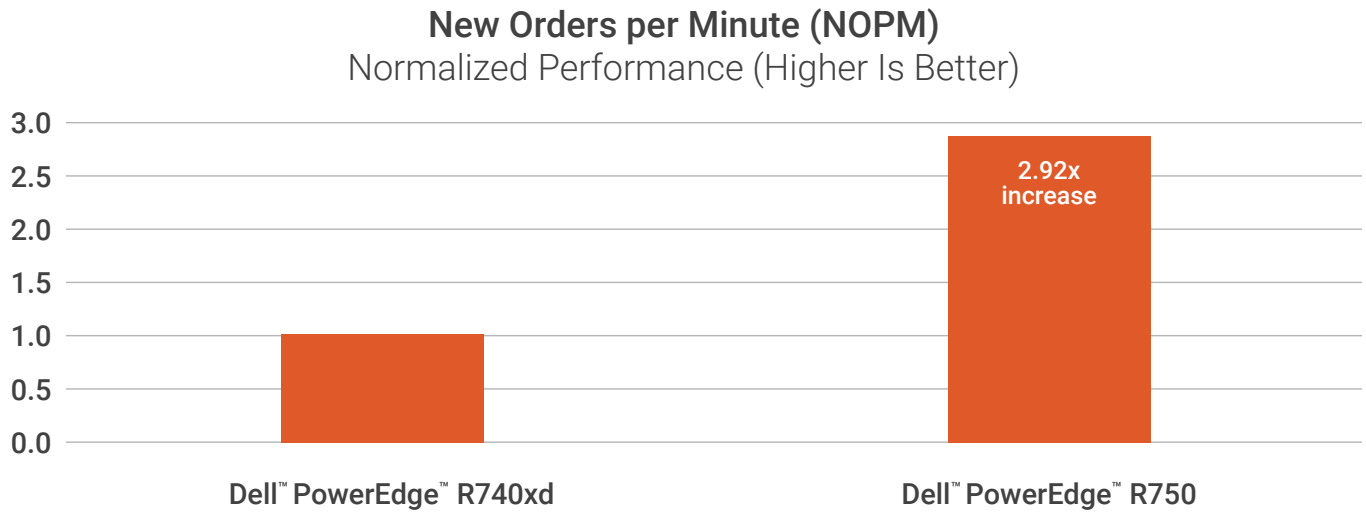

Figure 1 | Database performance in new orders per minute (NOPM), comparing a bare-metal Dell™ PowerEdge™ R740xd server with Dell™ PERC 10 RAID to a PowerEdge R750 server with PERC 11 RAID

Get the full story by reading the technical research report:

"For Peak Performance, Bare Metal with NVMe® RAID Comes Out on Top"

[1] Based on testing by Prowess Consulting as of July 2023. For configuration details, see "Behind the Report: Bare Metal with NVMe® RAID Comes Out on Top." 2023. https://prowessconsulting.com/project/dell-poweredge-r750-bare-metal-with-NVMe-raid-boosts-performance/.

[2] Note that BenchCraft does not conform to the TPC-C® testing standards, and results between BenchCraft and TPC-C are not comparable.

0923/220132