



Boost SQL Server OLTP performance by choosing Dell EMC PowerEdge R6525 servers powered by 3rd Gen AMD EPYC 7543 processors

For the same hardware and support price, these servers achieved more orders per minute (OPM) than a cluster of identical servers with 2nd Gen AMD EPYC 7532 processors

In our data center, we ran an online transactional processing (OLTP) database workload on a Dell EMC™ PowerEdge™ R6525 server cluster in two configurations—one with 3rd Gen AMD EPYC™ 7543 processors and one with 2nd Gen AMD EPYC 7532 processors. Each cluster ran Microsoft Hyper-V and hosted Microsoft SQL Server 2019 virtual machines.

We found that the Dell EMC PowerEdge cluster with the 3rd Gen AMD EPYC processors achieved 15.6 percent more OPM than the cluster with the 2nd Gen AMD EPYC processors. When we compared the cost for hardware plus support for the two clusters, we found that they were the same price, meaning that your organization could get better performance without paying more for it.



Process 15.6% more orders per minute*



Better performance for the same price*†

*vs. the same server cluster with AMD EPYC 7532 processors †Based on the total hardware cost with 3 years of Basic Next Business Day support

How we approached testing

Our hands-on testing measured the virtualized OLTP performance of the following Hyper-V cluster configurations backed by Microsoft Storage Spaces Direct:

- Three Dell EMC PowerEdge R6525 servers, each powered by two 3rd Gen AMD EPYC 7543 processors. As of March 25, 2021, the list price for hardware plus Basic Next Business Day support (36 months) for one server was \$38,561.01, for a total of \$115,683.03 for the three-server cluster.¹
- Three Dell EMC PowerEdge R6525 servers, each powered by two 2nd Gen AMD EPYC 7532 processors. As of March 25, 2021, the list price for hardware plus Basic Next Business Day support (36 months) for one server was \$38,561.01, for a total of \$115,683.03 for the three-server cluster.²

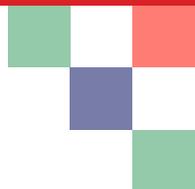
Both clusters ran Hyper-V with Failover Clustering and Storage Spaces Direct. Each cluster hosted 24 Microsoft SQL Server 2019 VMs (eight VMs per host), against which we ran the OLTP workload. We configured each cluster with 256 GB of RAM, two-port 25Gb NICs, and six NVMe™ SSDs. Details of the server configurations and our testing are available in the [science behind the report](#).

About 3rd Gen AMD EPYC 7543 processors

These 32-core processors use AMD Infinity Architecture and are part of the AMD EPYC 7003 Series. The latest offering from AMD, 3rd Gen EPYC processors offer increased I/O with up to 32MB L3 cache per core, 7nm x86 hybrid die core, and new security features such as Secure Encrypted Virtualization - Secure Nested Paging (SEV-SNP) and Encrypted State (SEV-ES).³ According to AMD, the EPYC 7543 model is well suited for workloads such as analytics, ERM/SCM/CRM apps, and apps requiring high VM density.⁴

Learn more at <https://www.amd.com/en/processors/epyc-7003-series>.





How each cluster performed

We used the DVD Store 3 (DS3) benchmarking tool to run an OLTP workload against each cluster. We summed the OPM that each of the 24 SQL Server VMs processed over the course of a 30-minute test run, and we show that per-cluster sum in Figure 1. The AMD EPYC 7543 processor-powered Dell EMC PowerEdge 6525 cluster came out on top with a rate of 264,551 OPM—an increase of 15.6 percent over the cluster with the 2nd Gen AMD EPYC 7532 processors, which performed at a rate of 228,678 OPM.

These results indicate that by investing in the 3rd Gen AMD EPYC 7543 processor-powered Dell EMC PowerEdge 6525 cluster rather than the cluster with the 2nd Gen AMD EPYC processors we tested, an organization could achieve better OLTP performance.

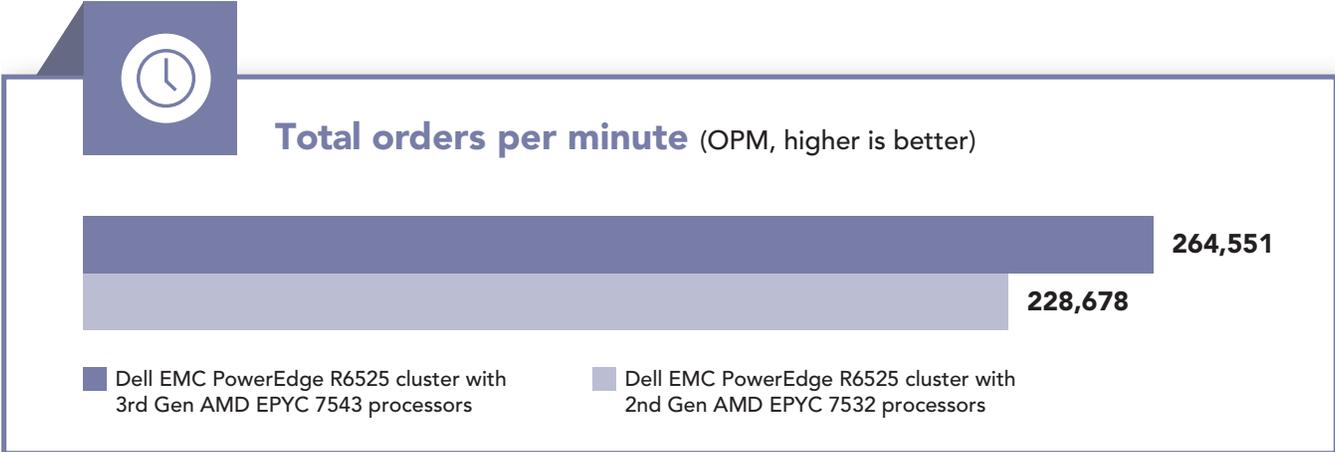


Figure 1: Total OPM each cluster achieved during testing. Higher is better. Source: Principled Technologies.

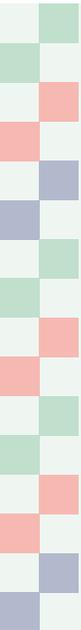


About Dell EMC PowerEdge R6525 rack servers

According to Dell Technologies, these servers have the following specifications:⁵

- Up to 128 high-performance AMD EPYC 3rd Gen cores in two sockets
- Up to 32 DDR4 RDIMM/LRDIMM slots
- Support for PCIe® Gen4 NVMe SSDs
- Integrated security features
- Embedded management tools

Learn more at <https://www.dell.com/en-us/work/shop/povw/poweredge-R6525>.





Real-world benefits for ecommerce

For large ecommerce organizations, small online retail stores, and businesses anywhere in between, the ability to support more customers could lead to more potential purchases and increased revenue. Hardware that can process more orders per minute, such as the Dell EMC PowerEdge R6525 server powered by 3rd Gen AMD EPYC 7543 processors, could help you support those additional customers, and therefore expand your business. In our tests, a cluster of three Dell EMC PowerEdge R6525 servers with the 3rd Gen processors achieved a rate of 264,551 OPM—a rate 15.6 percent higher than a cluster of the same servers with 2nd Gen AMD EPYC 7532 processors. If your small, medium, or large online business is looking at Dell EMC PowerEdge R6525 servers to process your orders, consider AMD EPYC 7543 processors to handle more transactions.

About Microsoft SQL Server 2019

According to Microsoft, the latest version of Microsoft SQL Server “builds on previous releases to grow SQL Server as a platform that gives you choices of development languages, data types, on-premises or cloud environments, and operating systems.”⁶ It includes features in the following areas: data virtualization and SQL Server 2019 Big Data Clusters, Intelligent Query Processing, In-Memory Database technologies, monitoring, developer experience, security, high availability, platform choice, and more.

Learn more about Microsoft SQL Server 2019 at <https://www.microsoft.com/en-us/sql-server/sql-server-2019>.



Conclusion

In hands-on testing, we found that a cluster of three dual-socket Dell EMC PowerEdge R6525 rack servers, each powered by 3rd Gen AMD EPYC 7543 processors, achieved 15.6 percent more transactional database OPM than a cluster of three of the same Dell EMC PowerEdge servers powered by 2nd Gen AMD EPYC 7532 processors. This performance indicates that organizations using the solution with the newer processors could support more transactions without higher hardware costs, potentially growing their business or meeting increased demands.

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- 1 "PowerEdge R6525 Rack Server," accessed March 25, 2021, https://www.dell.com/en-us/work/shop/cty/pdp/spd/poweredge-r6525/pe_r6525_13783_vi_vp.
 - 2 "PowerEdge R6525 Rack Server."
 - 3 "AMD EPYC 7003 Series Processors," accessed March 18, 2021, <https://www.amd.com/en/processors/epyc-7003-series>.
 - 4 "AMD EPYC 7543," accessed March 18, 2021, <https://www.amd.com/en/products/cpu/amd-epyc-7543>.
 - 5 "PowerEdge R6525," accessed March 25, 2021, https://i.dell.com/sites/csdocuments/Product_Docs/en/poweredge-r6525-spec-sheet.pdf.
 - 6 "What's new in SQL Server 2019 (15.x)," accessed March 24, 2021, <https://docs.microsoft.com/en-us/sql/sql-server/what-s-new-in-sql-server-ver15?view=sql-server-ver15>.

Read the science behind this report at <http://facts.pt/bXW5sRs> ►



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