Dell EMC™ PowerEdge™ studies

Get more from Dell EMC PowerEdge R750xs servers with 3rd Generation Intel Xeon Scalable processors

vs. Dell EMC PowerEdge R740xd servers with 2nd Generation Intel Xeon Scalable processors

Maybe the recent launch of next-generation Dell EMC PowerEdge servers has spurred you to look for previous-generation deals or maybe you're considering waiting to see if anything better comes along. In either case, the Dell EMC PowerEdge R750xs is a way for you to have your cake and eat it, too. Not only do these servers support the latest-generation processor, memory, networking, storage, and security technologies, our hands-on testing uncovered some compelling reasons to consider moving to Dell EMC PowerEdge R750xs servers now.

In the Principled Technologies data center, we compared transactional database performance, virtual machine (VM) density, and power efficiency on a Dell EMC PowerEdge R750xs server powered by two Intel® Xeon® Gold 6330 processors to that of a Dell EMC PowerEdge R740xd server powered by two Intel Xeon Gold 6230 processors. We found the Dell EMC PowerEdge R750xs we tested processed 76 percent more orders per minute (OPM), delivered 22 percent more OPM per watt, and supported three more VMs compared to a previous-generation Dell EMC PowerEdge R740xd.

Process 76% more orders per minute

Achieve 37% higher VM density

Handle 22% more OPM per watt

vs. a Dell EMC PowerEdge R740xd powered by 2nd Generation Intel Xeon Scalable processors

What we tested

To compare SQL Server 2019 transactional database performance on the two servers, we first created multiple Windows Server 2019 VMs with 40GB databases in a VMware® virtual environment. Then, we evaluated both servers three ways:

- We compared transactional database performance using the DVD Store 3 benchmark, which uses a simulated OLTP workload to measure performance in OPM.
- We determined VM density by adding VMs until each server reached 100 percent CPU utilization.
- We calculated power efficiency by calculating the performance per watt while the servers were active at 100 percent CPU utilization.

In our tests, the Dell EMC PowerEdge R750xs, powered by 3rd Generation Intel Xeon Scalable processors, processed more OPM, achieved higher VM density, and handled more OPM per watt.

About the Dell EMC PowerEdge R750xs server

This feature-optimized, 2U server is designed for virtualization, VDI, and software-defined storage node workloads. It comes with "full-stack management integration with Microsoft, VMware, ServiceNow, Ansible, and many other tools for on-premise, edge, and cloud environments."[1]

About 3rd Generation Intel Xeon Scalable processors

The Dell EMC PowerEdge R750xs server features Intel Xeon Gold 6330 processors, which are a direct upgrade to Intel Xeon Gold 6230 processors. These processors are, according to Intel, "optimized to power the industry's broadest range of workloads" and come with integrated AI acceleration (Intel DL Boost technology) and advanced security capabilities (Intel SGX and Intel Crypto Acceleration), which provide built-in data and application code protection.[2]

Table 1: The dual-socket 2U servers we tested offer the following specifications, according to Dell:

	Dell EMC PowerEdge R750xs[3]	Dell EMC PowerEdge R740xd[4]
Intel Xeon Scalable processors	3rd generation	2nd generation
Cores per socket*	Up to 32	Up to 28
Support for PCIe NVMe SSDs	Gen4	Gen3
Memory channels	8	6

To learn more, visit www.dell.com/en-us/work/shop/servers-storage-networking/sf/poweredge-rack-servers.

*In our tests, the Dell EMC PowerEdge R750xs was configured with 28-core processors and the Dell EMC PowerEdge R740xs was configured with 20-core processors. For more details, read the science behind the report.

More VMs without sacrificing transactional database performance

In e-commerce, maximizing the number of orders your servers handle could translate to less waiting for customers retrieving product descriptions, adding items to their carts, and making online purchases. But e-commerce isn't the only sector that relies on speedy database system performance. The ability to support more OLTP transactions per minute could speed up updating patient records, gathering financial data, and catering to clients' needs. When combined with higher VM density, this could translate to lower expenses related to data center power and cooling.

In our DVD Store 3 benchmark comparison, we found the Dell EMC PowerEdge R750xs shot past the previous-generation server in total number of OPM through higher VM density.

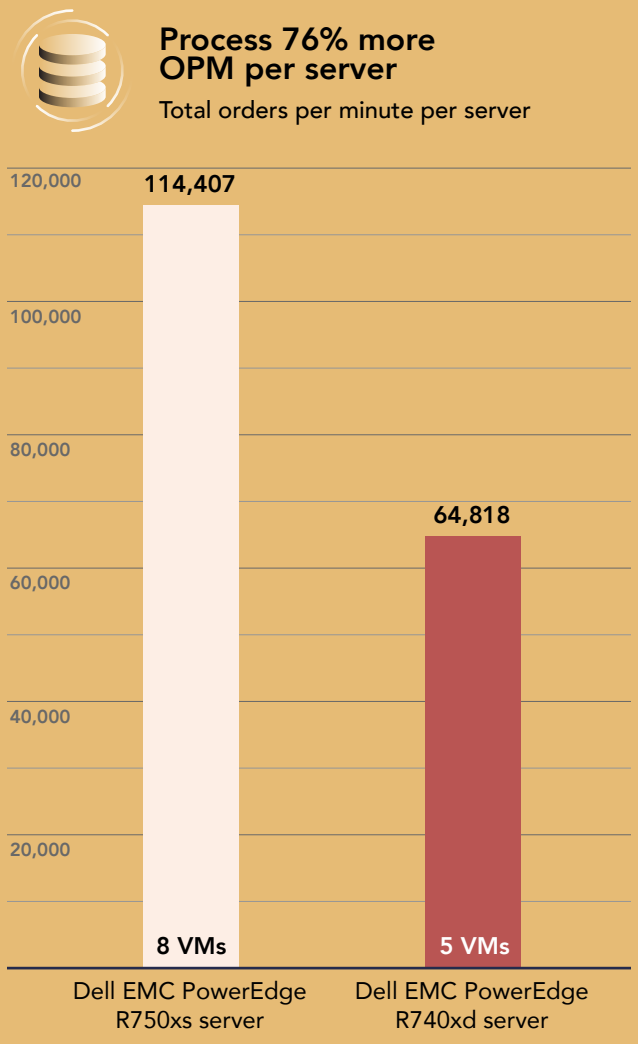

Figure 1: Total OPM per server based on DVD Store 3 benchmark results. Higher is better. Source: Principled Technologies.

The value of higher VM density

Maximizing the number of VMs your on-premises servers support can save your company money by requiring fewer resources, such as IT management, data center space, hardware, and power and cooling. We determined VM density by adding VMs until each system reached 100 percent CPU utilization. Adding more VMs to host servers running at 100 percent utilization in a virtualized environment would negatively impact individual VM OPM processing performance on the system under test.[5]

Achieve 37% higher VM density

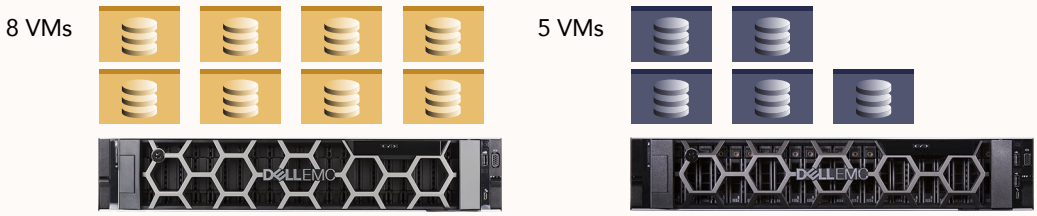

Figure 2: Total VMs per server. Higher is better. Source: Principled Technologies.

The value of better power efficiency

While reliable, high-performance servers are essential to grow your business and keep end-users happy, there is another important piece in the performance puzzle: energy consumption. In addition to its superior transactional database performance and VM density versus the previous-generation Dell EMC PowerEdge R740xd server, the Dell EMC PowerEdge R750xs delivered 22 percent more OPM per watt. This could, when combined with the higher VM density mentioned in the last section, translate to lower data center power and cooling expenses.

Realize 22% more OPM per watt

Average orders per minute per watt

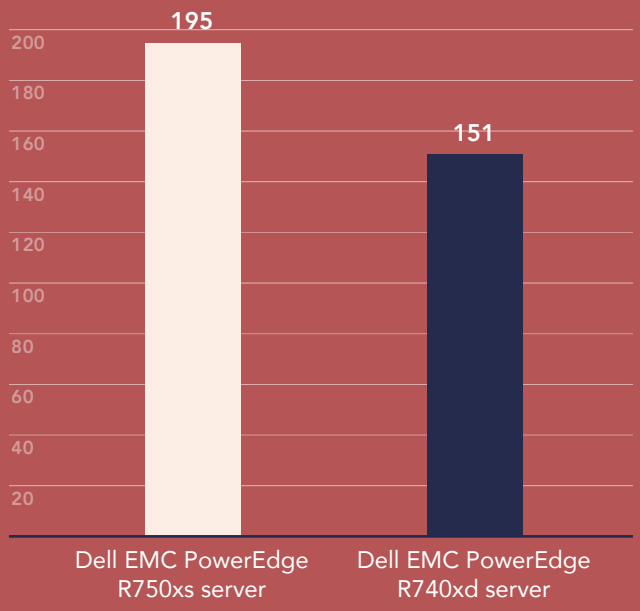

Figure 3: Average OPM per watt based on DVD Store 3 benchmark results. Higher is better. Source: Principled Technologies.

Conclusion

Along with 3rd Generation Intel Xeon Scalable processors, the Dell EMC PowerEdge R750xs server is loaded with next-gen memory, networking, storage, and security technologies. In our hands-on testing, the Dell EMC PowerEdge R750xs server powered by two Intel Xeon Gold 6330 processors processed 76 percent more OPM and supported three more VMs than a previous-generation Dell EMC PowerEdge R740xd server powered by two previous-generation Intel Xeon Gold 6320 processors—all while delivering 22 percent more OPM per watt. Imagine what these server performance increases could do for your company's bottom line.

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1 Dell Technologies, "Dell EMC PowerEdge R750xs spec sheet," accessed August 2, 2021, https://i.dell.com/sites/csdocuments/Product_Docs/en/r750xs-spec-sheet.pdf.

2 Intel Newsroom, "Intel Launches Its Most Advanced Performance Data Center Platform," accessed August 1, 2021, https://www.intel.com/content/www/us/en/newsroom/news/3rd-gen-xeon-scalable-processors.html.

3 Dell Technologies, "Dell EMC PowerEdge R750xs spec sheet," accessed August 2, 2021, https://i.dell.com/sites/csdocuments/Product_Docs/en/r750xs-spec-sheet.pdf.

4 Dell Technologies, "Dell EMC PowerEdge R740xd spec sheet," accessed August 2, 2021, https://i.dell.com/sites/csdocuments/Shared-Content_data-Sheets_Documents/en/poweredge-r740xd-spec-sheet.pdf.

5 Heroix, "Maximizing VMware Performance and CPU Utilization," accessed August 6, 2021, https://www.heroix.com/blog/vmware-vcpu-over-allocation/.

Read the science behind this report at http://facts.pt/6sX26zb ▶

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