Executive summary

Upgrade to Dell EMC PowerEdge R940 servers with VMware vSphere 7.0 and gain greater OLTP performance

This newer solution processed more operations per minute than a previous-generation Dell EMC PowerEdge R930 with VMware vSphere 6.7

If your organization is using previous-generation servers, you might be tempted to think that the performance you're getting is good enough. But upgrading to the latest hardware and software can provide better performance and new features that can help you better manage your environment.[1] To quantify the benefits of a newer solution, we tested a Dell EMC™ PowerEdge™ R940 server equipped with the latest edition of VMware vSphere® 7.0, against a previous-generation Dell EMC PowerEdge R930 with VMware vSphere 6.7.

We used Oracle® Database 19c and the benchmark tool DVD Store 3 to test online transactional processing (OLTP) performance. The Dell EMC PowerEdge R940 with Intel® Xeon® Platinum 8260 processors handled 30 percent more operations per minute than the Dell EMC PowerEdge R930 with Intel Xeon E7-8890 v3 processors. It also offered additional hardware and software features such as 2nd Generation Intel Xeon Scalable processors (with up to 16 percent more cores per processor), 30 percent more PCIe capacity, up to 28 percent more DDR4 memory, and new update capabilities with vSphere Lifecycle Manager and Dell EMC OpenManage Integration for VMware vCenter® (OMIVV).[2]

By upgrading the previous-generation solution we tested to Dell EMC PowerEdge R940 servers with VMware vSphere 7.0, organizations could support more customers when running transactional database workloads.

Boost transactional database performance

When we ran an OLTP workload on each solution, the newer Dell EMC PowerEdge R940 server handled 30 percent more operations per minute than the older Dell EMC PowerEdge R930 server. A solution that offers greater OLTP performance could support more users, potentially enabling organizations to expand their customer base.
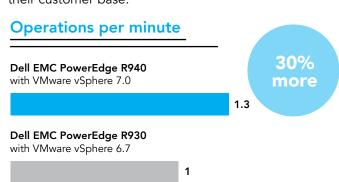
Operations per minute

Dell EMC PowerEdge R940
with VMware vSphere 7.0

1.3

Dell EMC PowerEdge R930
with VMware vSphere 6.7

1

30% more

Figure 1: Operations per minute (normalized). Higher is better. Source: Principled Technologies.

Major feature comparison of Dell EMC PowerEdge R930 and R940 servers

The Dell EMC PowerEdge R940 server configuration we tested costs approximately US$98,556.00. We obtained this pricing information through a third-party reseller on November 12, 2020. The quote included the server hardware, VMware vSphere 7.0, Dell ProSupport, and Next Business Day Onsite Service (the VMware software and Dell support services were for three years). Note that the RAM in the quotes we received was for 3,200 MT/s, but we tested with 2,666 MT/s of RAM. Below is a table comparing the platform configuration capabilities of the Dell EMC PowerEdge R930 and R940. By upgrading from the Dell EMC PowerEdge R930 platform to the R940 platform, organizations could get up to 16 percent more cores per processor, up to 28 percent more DDR4 memory, and 30 percent more PCIe capacity.

Feature	Dell EMC PowerEdge R930[3]	Dell EMC PowerEdge R940[4]	Difference with Dell EMC PowerEdge R940
Processors	Up to four Intel Xeon E7-8800 v4 and E7-4800 v4 processors	Up to four 2nd Generation Intel Xeon Scalable processors	Newer Intel Xeon processors
Cores	Up to 24 per processor	Up to 28 per processor	Up to 16% more cores per processor
Memory	Up to 12 TB of DDR4 memory	Up to 15.36 TB of DDR4 memory	Up to 28% more DDR4 memory
PCIe capacity	10 PCIe 3.0 slots	13 PCIe Gen. 3 slots	30% more PCIe capacity

How the latest VMware vSphere 7.0 features could scale with your Dell EMC environment

We focused on single-node database virtualization in our testing, but many virtualized environments rely on multiple nodes for additional performance, capacity, and data protection. VMware vSphere 7.0 provides new features that further support both small and large virtualized environments, such as vSphere Lifecycle Manager (vLCM), improved Distributed Resource Scheduler (DRS), and improved VM template management.[5, 6, 7] In addition to these features, Dell EMC offers OMIVV and Dell EMC add-ons, which can help organizations support Dell EMC PowerEdge environments of varying sizes. We did not test these features, and gathered the information cited here from publicly available sources.[8, 9]

1   See the PT reports "New VMware vSphere 7.0 features reduced the time and complexity of routine update and hardware compliance tasks" (*http://facts.pt/chz3xgi*) and "Elevate your e-commerce business by upgrading to the Dell EMC PowerEdge R740xd with 2nd Generation Intel Xeon Scalable processors" (*http://facts.pt/4mw53ty*).

2   Calculations based on datasheets for the Dell EMC PowerEdge R930 (*https://i.dell.com/sites/doccontent/shared-content/data-sheets/en/Documents/PowerEdge_R930_spec_sheet-FINAL.pdf*) and R940 (*https://i.dell.com/sites/csdocuments/Shared-Content_data-Sheets_Documents/en/aa/poweredge-r940-spec-sheet.pdf*).

3   Dell EMC, "PowerEdge R930," accessed 10/28/2020, *https://i.dell.com/sites/doccontent/shared-content/data-sheets/en/Documents/PowerEdge_R930_spec_sheet-FINAL.pdf*.

4   Dell EMC, "PowerEdge R940," accessed 10/28/2020, *https://i.dell.com/sites/csdocuments/Shared-Content_data-Sheets_Documents/en/aa/poweredge-r940-spec-sheet.pdf*.

5   Dell Technologies, "VMware vSphere Life Cycle Manager (vLCM) and Dell EMC integration," accessed 10/28/2020, *https://downloads.dell.com/manuals/all-products/esuprt_software_int/esuprt_software_virtualization_solutions/vmware-esxi-7x_white-papers3_en-us.pdf*.

6   Adam Eckerle, "Introducing vSphere 7: Features & Technology for the Hybrid Cloud," accessed 11/13/2020, *https://blogs.vmware.com/vsphere/2020/03/vsphere-7-features.html*.

7   Nigel Hickey, "vSphere 7 – Content Library," accessed 10/30/2020, *https://blogs.vmware.com/vsphere/2020/04/vsphere-7-content-library.html*.

8   Dell Technologies, "OpenManage Integration for VMware vCenter," accessed 10/28/2020, *https://www.dell.com/support/article/en-us/sln311238/openmanage-integration-for-vmware-vcenter?lang=en*.

9   Dell Technologies, "VMware vSphere Life Cycle Manager (vLCM) and Dell EMC integration," accessed 10/28/2020, *https://downloads.dell.com/manuals/all-products/esuprt_software_int/esuprt_software_virtualization_solutions/vmware-esxi-7x_white-papers3_en-us.pdf*.

Read the report at http://facts.pt/szO7jA6 ▶

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