Consolidate three legacy servers onto one Dell EMC PowerEdge R940 with 2nd Generation Intel Xeon Scalable processors

Shrink your footprint while gaining the latest in storage technology, embedded management, and other benefits

If your data center currently houses a bevy of legacy servers, you may wonder what the latest technology could do for your mission-critical database performance. In the Principled Technologies data center, we found that the Dell EMC™ PowerEdge™ R940 with 2nd Generation Intel® Xeon® Scalable processors handled over 3.14 times the workload transactions per minute (TPM) of an Oracle Database using the TPC-C-like HammerDB benchmark compared to a legacy Dell PowerEdge R920.

This large Oracle Database performance increase means that a single Dell EMC PowerEdge R940 could replace three of these 4U legacy servers, or 12U of servers, in just 3U of rack space, reducing the number of servers you must store, power, license, and manage and freeing up significant data center space. By moving to the Dell EMC PowerEdge R940, your organization also gets immediate access to NVMe drive technology, the latest in iDRAC management, and hardware that is less likely to need frequent, costly repair. By delivering all these benefits, consolidating your legacy servers onto new Dell EMC PowerEdge R940 servers with 2nd Generation Intel Xeon Scalable processors can deliver real business benefits now while providing the capacity and workload acceleration to prepare your organization for future growth.

Support more database users per server
3.14x the transactions per minute

Save rack space through consolidation
75% space reduction consolidating 3 servers into 1

Benefits of consolidating with the Dell EMC PowerEdge R940 rack server

Since you last invested in data center servers, technology has continued to advance. Today's technology, which includes advances in drives and processors, can handle more work than ever—enough to do the work of many older servers. Consolidating older servers onto fewer new ones can deliver several benefits to your organization, including:

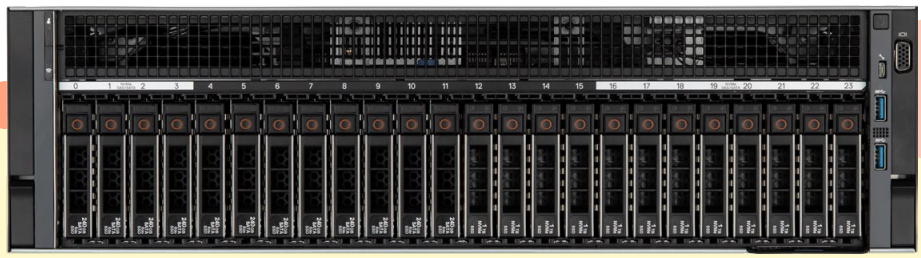
- Less admin hands-on time when you reduce the number of servers they have to deploy, manage, or maintain
- Reduced operating costs related to power and cooling, ports, and cabling
- Lower licensing costs for database and OS software
- More efficient use of data center space, which can delay build-out costs or the addition of a second location
- Current-generation embedded management technologies that can ease management burdens
- Support for new storage technologies such as NVMe drives that can further accelerate demanding workloads

We compared the Oracle Database performance of a new Dell EMC PowerEdge R940 with 2nd Generation Intel Xeon Scalable processors to that of a legacy four-socket server, the Dell PowerEdge R920, and found that it could serve as a consolidation platform to help you realize these kinds of benefits.

About 2nd Generation Intel Xeon Scalable processors

The latest from Intel, the 2nd Generation Intel Xeon Scalable processor platform features a wide range of processors to support the workloads you run, including Bronze, Silver, Gold, and Platinum. According to Intel, the 2nd Generation Intel Xeon Scalable platform can handle a variety of workloads, including enterprise, cloud, HPC, storage, and communications.[1] This new processor line also supports a new memory and storage technology to further accelerate workloads, Intel® Optane™ DC persistent memory.

To learn more about the 2nd Generation Intel Xeon Scalable processor family, visit https://www.intel.com/content/www/us/en/products/docs/processors/xeon/2nd-gen-xeon-scalable-processors-brief.html.



About the Dell EMC PowerEdge R940 rack server

The Dell EMC PowerEdge R940 is a 3U, four-socket server powered by 2nd Generation Intel Xeon Scalable processors with up to 28 cores per processor. It features 48 DDR4 DIMM slots, up to 184 TB of storage, and up to 12 NVMe drives. According to Dell EMC, the PowerEdge R940 supports demanding workloads such as in-memory and complex databases, dense virtualization, and real-time data analytics.[2]

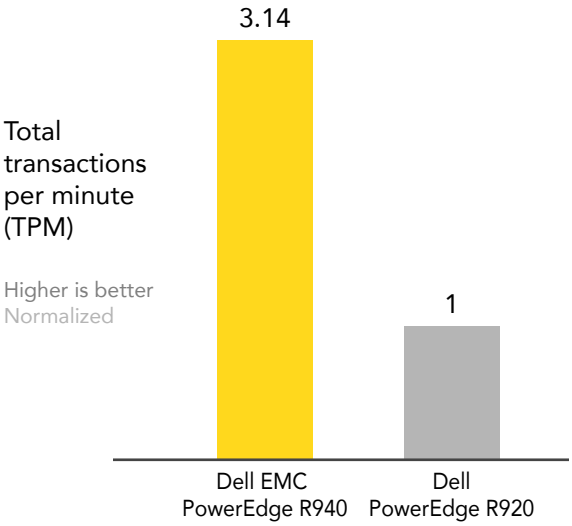
To learn more about the Dell EMC PowerEdge R940, visit https://www.dell.com/en-us/work/shop/povw/poweredge-r940.

More Oracle Database performance lets you consolidate older servers

Mission-critical databases require hardware that can handle a large number of transactions so they can serve many customers, even during peak activity. Using the TPC-C-like HammerDB benchmark, the Dell EMC PowerEdge R940 with 2nd Generation Intel Xeon Scalable processors dramatically outperformed the legacy Dell PowerEdge R920, achieving 3.14 times the TPM. Please note that the Oracle Database EULA does not permit us to publish exact results, so we've done the math and normalized performance numbers between the two platforms to make our comparison.

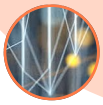
Support more database users per server

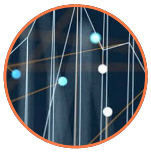
3.14x the TPM



If you replace servers one to one, you'll be able to handle 3.14 times the transactions and save 1U of space for each server, which can meet your needs now and as your business grows. Or, you can take advantage of the benefits inherent in consolidation and shrink your data center by investing in a single new Dell EMC PowerEdge R940 for every set of three legacy servers. Fewer servers could reduce your operating expenses, including costs associated with power and cooling, management, and more. Because many software companies license their products (including Oracle Database and Microsoft Windows Server) by processor or processor core, consolidating systems can significantly lower database and/or OS licensing costs as well.

Plus, legacy hardware is outdated and may begin to fail, requiring more time and effort from administrators to keep their important workloads running. New hardware restarts the clock on aging hardware and incorporates the latest in management and storage technologies—such as the NVMe drives we used in our testing—which can drive performance even higher.





About HammerDB

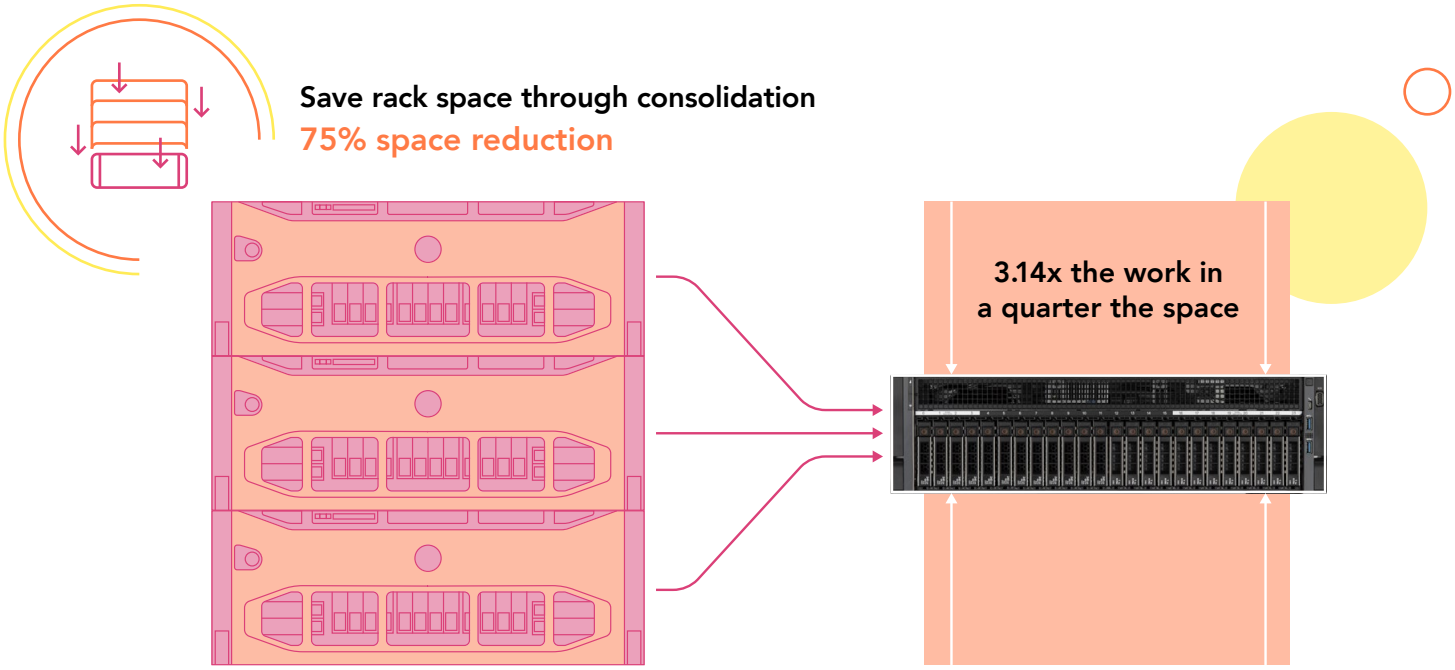
We tested each server with an OLTP workload from the HammerDB suite of benchmarks. Their TPC-C-like benchmark gives results in TPM. Note: HammerDB results aren't official TPC-C results and are therefore not comparable.

To learn more about TPM and other information specific to our benchmark workloads, visit the HammerDB website at www.hammerdb.com.

Improving data center efficiency

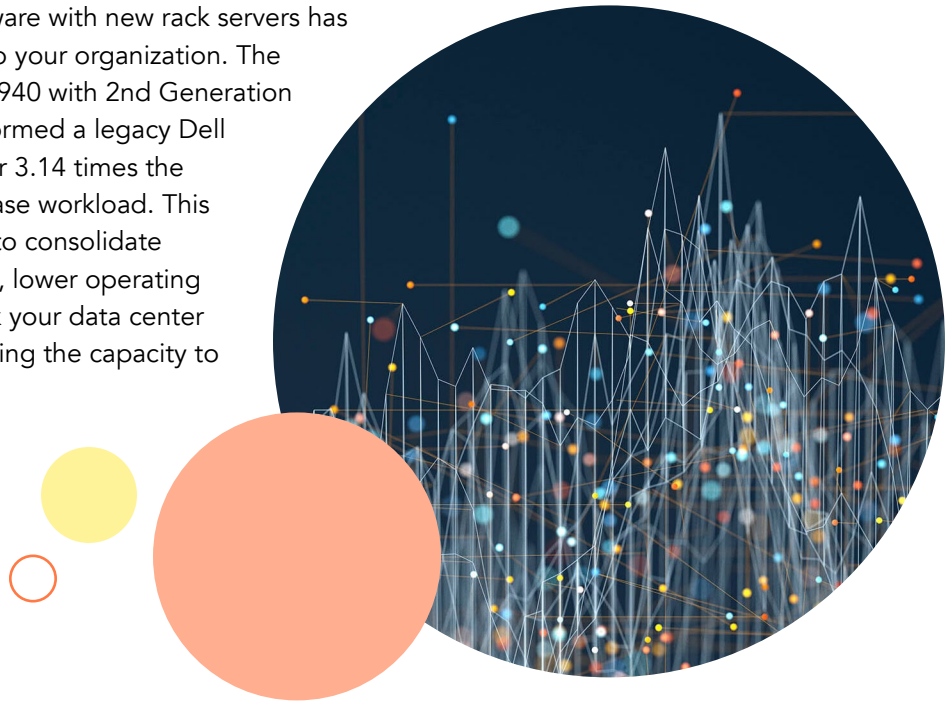
In addition to its strong overall database performance, another factor makes the Dell EMC PowerEdge R940 with 2nd Generation Intel Xeon Scalable processors a particularly attractive consolidation target: it's a four-socket server in a sleek 3U chassis. This means that even if you replaced your legacy 4U server one to one with the new Dell EMC PowerEdge R940, you'd be able to reduce rack space by a quarter.

But upgrading from the legacy server we tested can deliver even larger space savings when you consider the consolidation possible: a single new Dell EMC PowerEdge R940 can do the same work as three legacy servers, which means you shrink your data center footprint from 12U down to just 3U. That's a 75 percent savings in rack space, which can help you use your data center more efficiently and put off expensive expansion projects.



Handle more transactions on the Dell EMC PowerEdge R940 with 2nd Generation Intel Xeon Scalable processors

Replacing your aging data center hardware with new rack servers has the potential to deliver many benefits to your organization. The 3U, four-socket Dell EMC PowerEdge R940 with 2nd Generation Intel Xeon Scalable processors outperformed a legacy Dell EMC PowerEdge R920 by handling over 3.14 times the TPM on a mission-critical Oracle Database workload. This boost in performance would allow you to consolidate your data center and improve efficiency, lower operating costs, reduce licensing costs, and shrink your data center footprint by 75 percent, all while providing the capacity to handle significant growth as your business continues to evolve.



1 Intel, "2nd Gen Intel Xeon Scalable Processors Brief," accessed August 8, 2019, https://www.intel.com/content/www/us/en/products/docs/processors/xeon/2nd-gen-xeon-scalable-processors-brief.html.

2 Dell EMC, "PowerEdge R940 Rack Server," accessed August 8, 2019, https://www.dell.com/en-us/work/shop/povw/poweredge-r940.

Read the science behind this report at http://facts.pt/yjg7jd0 ▶

Principled Technologies®

Facts matter.®

This project was commissioned by Dell EMC.