

# Today's Healthcare Workloads Need Modern Infrastructure that Can Keep Up

Research Abstract

## From Databases to VDI to AI-Based Diagnostics: Performance is Key

Healthcare organizations have unique infrastructure needs due to their diverse workloads and regulatory requirements. For example, organizations typically run database and analytics workloads to support electronic health records (EHRs). They also need to support unique emerging artificial intelligence (AI) workloads that require specialized performance. It's also common for healthcare organizations to rely heavily on virtual desktop infrastructure (VDI) to better manage user access.

Across all these scenarios, security is critical to protect confidential medical and billing records. But older-generation servers might not be able to provide the levels of performance and security that modern healthcare organizations need.

Newer Dell™ PowerEdge™ servers with 32-core 3rd Gen AMD EPYC™ processors offer several benefits for performance, manageability, and security. But are those benefits enough to warrant an upgrade?

## Test Results Show Marked Performance Gains

Testing by Prowess Consulting showed marked improvements to benchmark performance for database and big data workloads. Our analysis also uncovered additional benefits provided by the newer Dell platform that can help organizations achieve higher levels of performance for diverse healthcare workloads, along with strong levels of protection from emerging cyberthreats.

## Database Workload

Testing used the HammerDB TPROC-H benchmark to measure database performance because this benchmark offers an accurate representation of the read-heavy (as opposed to transactional) nature of most healthcare database workloads, where doctors and clinicians need to frequently access varying amounts of both simple and complex data. The Dell PowerEdge R7515 server showed significant performance gains over the Dell PowerEdge R730 server in HammerDB TPROC-H testing against both a 100 GB database and a 300 GB database.

**The Dell™ PowerEdge™ R7515 server, compared to the Dell PowerEdge R730 server, can provide:**

Up to  
**64%**  
faster  
query times<sup>1</sup>

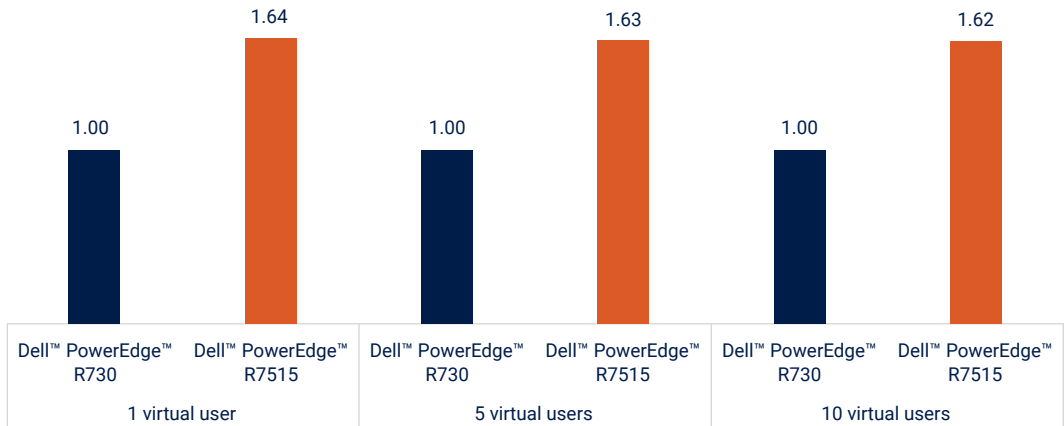
Up to  
**73%**  
faster AI  
processing<sup>1</sup>

Industry-leading  
performance  
for virtualization<sup>2</sup>

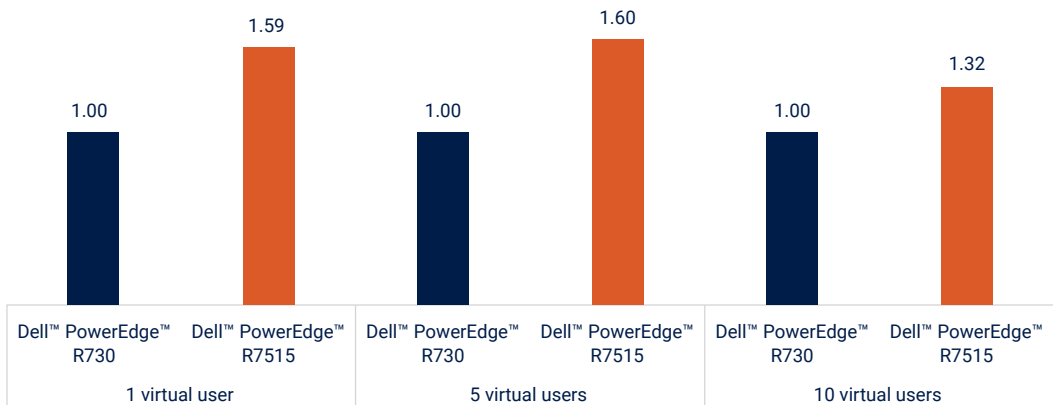
Strong built-in  
encryption  
for memory and  
virtualization<sup>1</sup>

One efficient  
32-core CPU,  
versus two  
16-core CPUs<sup>1</sup>

### HammerDB TPROC-H Testing with a 100 GB Database (higher is better)



### HammerDB TPROC-H Testing with a 300 GB Database (higher is better)

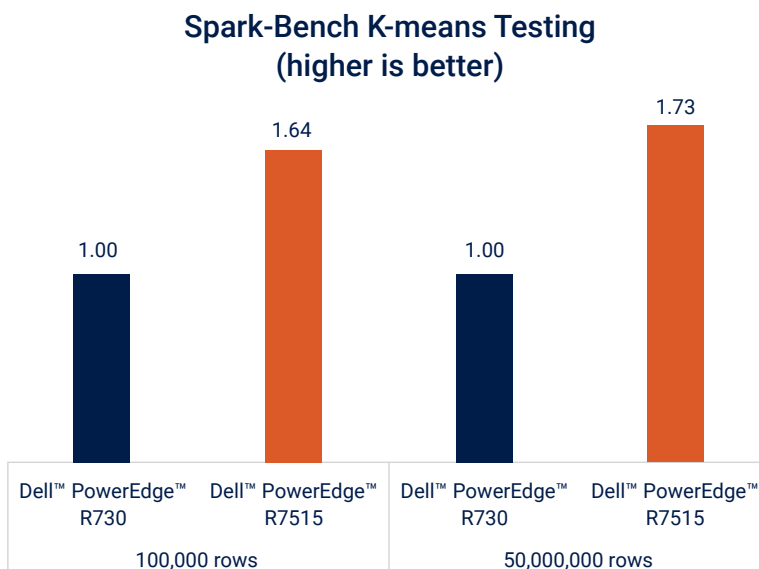


#### The Dell™ PowerEdge™ R7515 server, powered by AMD EPYC™ 7543 processors, brings power and security to healthcare with:

- High core count, high-frequency CPU, fast memory bus, and fast PCIe® 4.0 interconnect<sup>1</sup>
- Support for greater numbers of virtual desktop infrastructure (VDI) sessions and users, compared to prior-generation servers<sup>2</sup>
- Strong, built-in security technologies, including AMD® Secure Memory Encryption (AMD® SME), AMD® Secure Encrypted Virtualization-Encrypted State (AMD® SEV-ES), and a silicon root of trust from the integrated Dell™ Remote Access Controller (iDRAC)
- Dell secure supply chains, backed by Secured Component Verification (SCV)

## Big Data/AI Workload

Spark-Bench with the k-means workload was selected to measure big data/AI performance because this benchmark represents workloads typically performed by healthcare organizations analyzing large data sets to find patterns in diseases and treatments. Testing demonstrated performance gains of up to 1.64x for the Dell PowerEdge R7515 server over the Dell PowerEdge R730 server for 100,000 rows and up to 1.73x for 50,000,000 rows.



## Learn More

Get the full story by reading our paper, "[Accelerate Big Data and Database Workloads in Healthcare.](#)"

<sup>1</sup> Dell Technologies specification sheets for Dell™ PowerEdge™ R730 (<https://i.dell.com/sites/doccontent/shared-content/data-sheets/en/Documents/Dell-PowerEdge-R730-Spec-Sheet.pdf>) and Dell PowerEdge R7515 ([https://i.dell.com/sites/csdocuments/Product\\_Docs/en/poweredge-r7515-spec-sheet.pdf](https://i.dell.com/sites/csdocuments/Product_Docs/en/poweredge-r7515-spec-sheet.pdf)) servers.

<sup>2</sup> AMD. MLN-004. Login VSI™ Pro v4.1.40.1 comparison based on AMD internal testing as of 02/01/2021 measuring the maximum "knowledge worker" desktop sessions within VSI Baseline +1,000 ms response time using VMware ESXi™ 7.0u1 and VMware Horizon® 8 on a server using 2 x AMD EPYC™ 7763 processors versus a server with 2 x Intel® Xeon® Gold 6258R processors for ~112 percent more max [~2.1x the] performance. Results may vary.



The analysis in this document was done by Prowess Consulting and commissioned by Dell Technologies.

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