Innovation Wins: Dell PowerEdge R770 Delivers 15x Speed, 6:1 Consolidation, 12.7kW Savings vs. SuperMicro

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Overview

Modern data centers demand smarter infrastructure. A common question IT infrastructure managers face is: “How can I reduce power consumption on my existing infrastructure to support AI workloads?”

The answer: Consolidate and Modernize.

Replace your aging, power-hungry SuperMicro servers with the Dell PowerEdge R770—a platform engineered for efficiency, performance, and AI readiness. Don’t let legacy infrastructure limit your AI potential. Upgrade to the Dell PowerEdge R770 and unlock the power already available in your data center.

The Dell PowerEdge R770 delivers:

- Space Efficiency: Its compact design optimizes data center space, allowing for streamlined operations
- Advanced Power Management: Built-in features reduce energy consumption and lower operational costs.
- Enhanced Cooling: Innovative thermal technologies minimize the need for extensive cooling infrastructure.

Overall, the PowerEdge R770 is ideal for organizations looking to modernize their data center with a focus on performance, energy efficiency, and cost savings.

Key findings

The Dell PowerEdge R770 with the latest 8-core 6th Generation Intel Xeon SP CPU offers improvements in performance, latency, and performance per watt compared to the SuperMicro AS-2023US-TR with an 8-core AMD EPYC 7251 CPU:

- 15.89x improved performance [1]
- 16.07x lower latency [2]
- 6.04x better performance per watt [3]
- 12.7 kW power savings [4]

Benchmarking overview: Phoronix PostgreSQL

Dell deployed the Phoronix PostgreSQL benchmarking tool to evaluate performance, latency, and power consumption on both platforms. The test configuration included:

- Scaling: 1000
- Clients: 250
- All tests were performed in the Dell Technical Marketing Engineering labs in May 2025.

Configuration overview

The configurations below were used for testing.

Hardware Component	Dell PowerEdge R770	SuperMicro AS-2023US-TR
CPU	Intel ® Xeon ® 6714P	AMD EPYC™ 7251
# of Cores	8 Cores	8 Cores
CPU Frequency	4.0 GHz	2.1 GHz
Installed Memory	256 GB (16x 16 GB)	128 GB (16x 8 GB)
Memory Frequency	6400 MT/s	2666 MT/s
Storage Protocol	NVMe Drives	NVMe Drives
Networking	Broadcom Adv. Quad 25Gb Ethernet	AOC-2UR68-i4G Ethernet
Operating System	Ubuntu 22.04.5	Ubuntu 22.04.5

Performance and results

The Dell PowerEdge R770 with the latest 8-core 6th Generation Intel Xeon SP delivered up to 15.89x higher compute performance than the SuperMicro AS-2023US-TR with 8-core AMD EPYC 7251 CPU.

Using the Phoronix PostgreSQL benchmark with a scaling factor of 1000 and 250 clients:

- Dell PowerEdge R770 achieved 8423 Transactions Per Second (TPS)
- SuperMicro AS-2023US-TR achieved 530 TPS

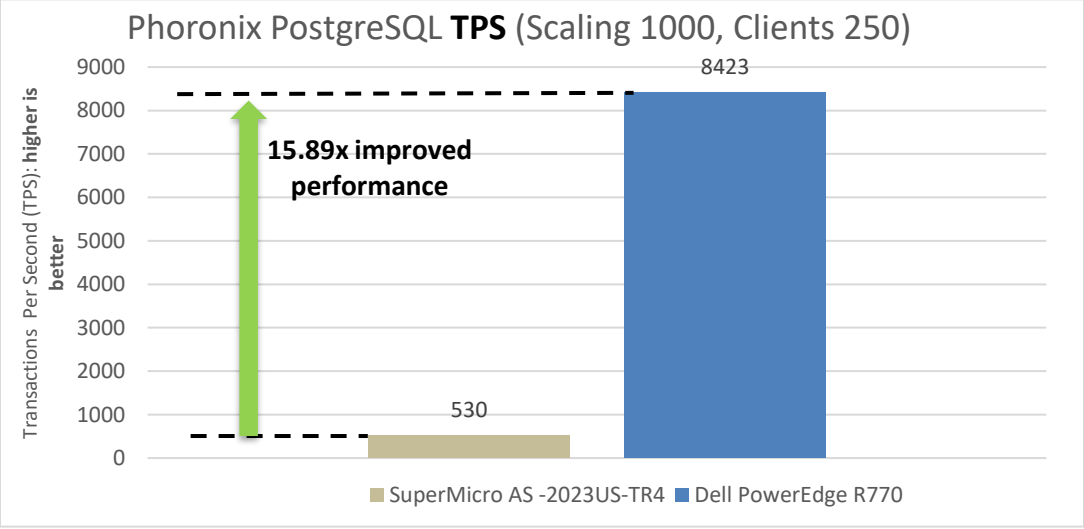

Figure 1. Transactions Per Second (TPS) comparison between Dell PowerEdge R770 and SuperMicro AS-2023US-TR using the Phoronix PostgreSQL benchmark.

The Dell PowerEdge R770 also achieved 16.07x lower latency than the SuperMicro AS-2023US-TR while running Phoronix PostgreSQL (scaling factor: 1000, clients: 250).

- Dell PowerEdge R770: 29.68 ms
- SuperMicro AS-2023US-TR: 477 ms

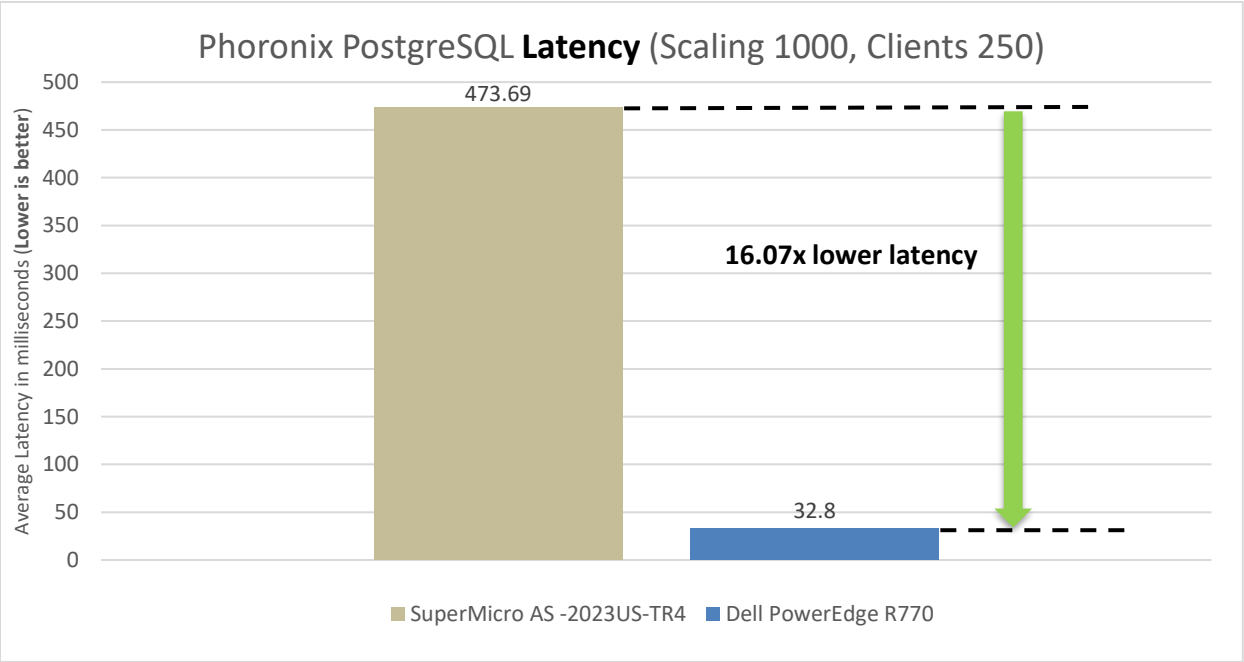

Figure 2. Latency comparison between Dell PowerEdge R770 and SuperMicro AS-2023US-TR using the Phoronix PostgreSQL benchmark.

The Dell PowerEdge R770 also demonstrated a 6.04x improvement in performance per watt compared to the SuperMicro AS-2023US-TR:

- Dell PowerEdge R770: 18.97
- SuperMicro AS-2023US-TR: 3.14

This translates to a 6:1 consolidation ratio, meaning one PowerEdge R770 can replace six SuperMicro AS-2023US-TR servers—significantly reducing power and cooling costs and lowering total cost of ownership (TCO).

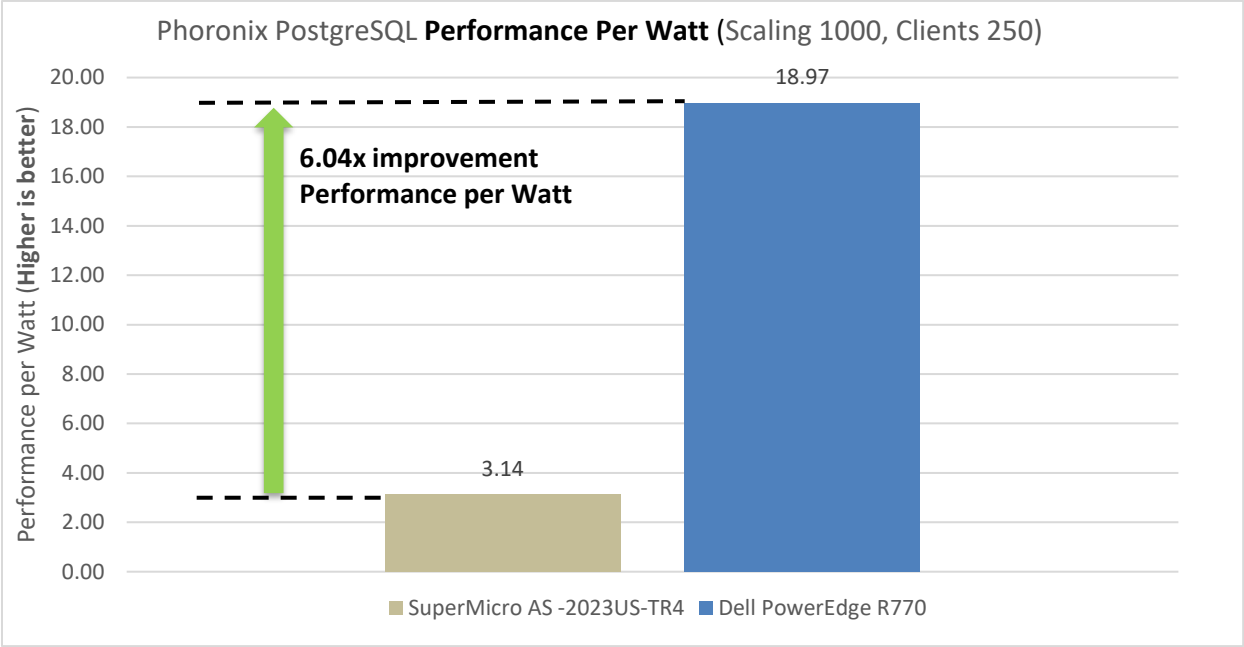

Figure 3. Performance per watt comparison between Dell PowerEdge R770 and SuperMicro AS-2023US-TR.

Upgrade your data center with the Dell PowerEdge R770

With a 6.04x improvement in performance per watt over the SuperMicro AS-2023US-TR, the Dell PowerEdge R770 sets a new standard for data center efficiency.

This performance leap enables a 6:1 server consolidation ratio. In practical terms, 126 SuperMicro servers can be replaced with just 21 Dell PowerEdge R770 units.

This consolidation delivers significant benefits:

- Reduced power consumption
- Lower cooling requirements
- Optimized rack space utilization

For organizations building modern, sustainable, and high-density data centers, the PowerEdge R770 offers a compelling path forward.

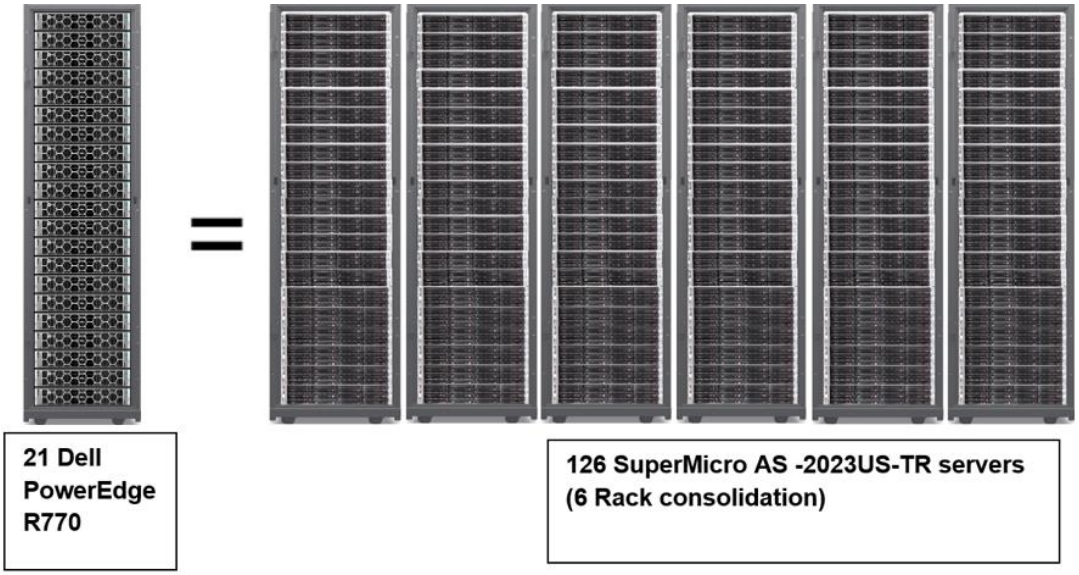

Fig 4. 6:1 server consolidation: 21 Dell PowerEdge R770 servers replace 126 SuperMicro AS-2023US-TR servers across six racks, enabling significant space and power savings.

Save power to do more

Running 126 SuperMicro systems results in higher cumulative power draw, increased physical footprint, and greater cooling and maintenance overhead.

By consolidating to 21 Dell PowerEdge R770 servers, organizations can reduce operational complexity, lower electricity and cooling costs, and save up to 12 kW of power [4], capacity which can be redirected to support AI workloads or other high-performance systems.

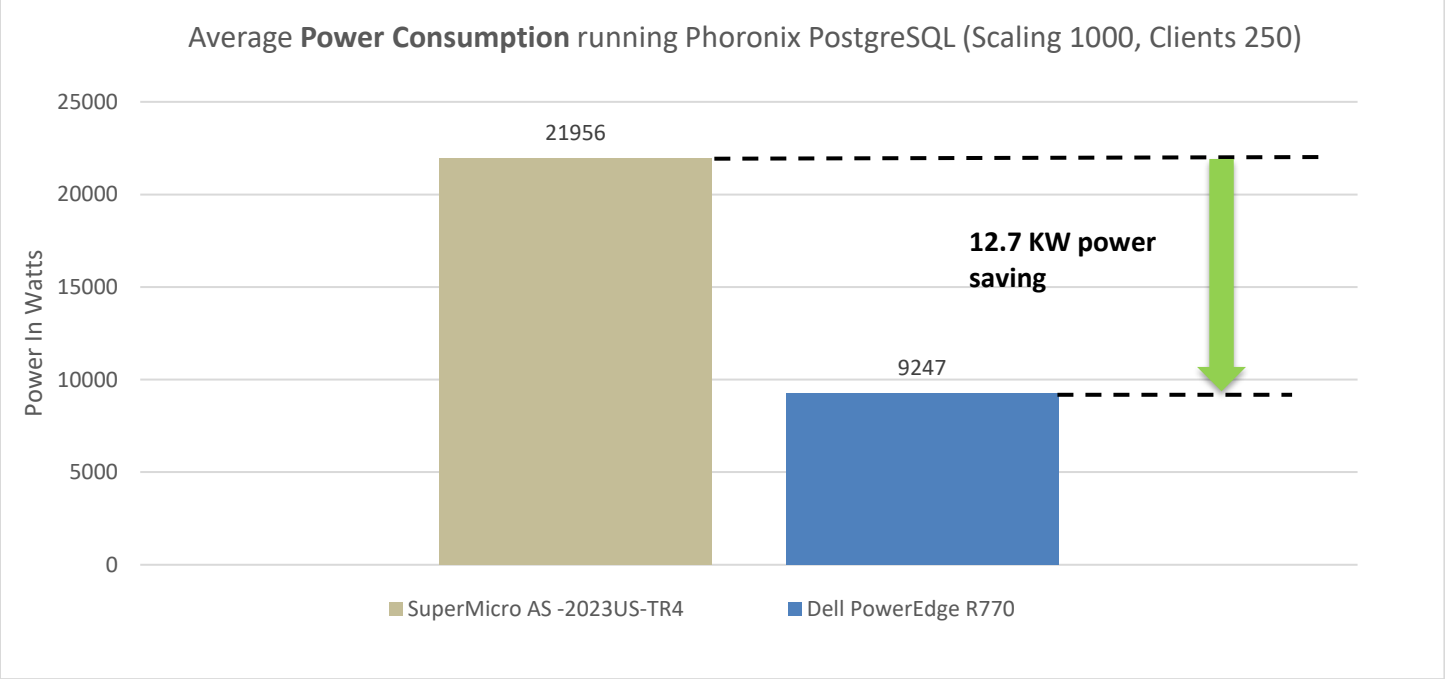

Fig 5. Average power consumption comparison during Phoronix PostgreSQL benchmark (Scaling: 1000, Clients: 250).

Conclusion

For customers seeking a high-performance, low-latency, and power-efficient rack server solution, the Dell PowerEdge R770 is the ideal choice.

Engineered with the Data Center Modular Hardware System (DC-MHS) design, the PowerEdge R770 delivers exceptional scalability and serviceability. Powered by Intel Xeon processors with Performance-cores (P-cores), it offers outstanding compute capabilities while maintaining energy efficiency.

With advanced cooling technologies and a design optimized for modern workloads, the PowerEdge R770 is built to meet the evolving demands of today's data centers, whether for AI, virtualization, or high-density cloud environments.

References

[1] Based on Claim ID CLM-014313 - Testing was conducted by Dell Server TME with the servers located in Dell Labs during the May 2025 timeframe, The R770 server ran 2 socket GNR CPU 6714P which has 8 Cores compared to SuperMicro AS -2023US-TR4 server running 2 socket AMD EPYC 7251 CPU which has 8 cores

[2] Based on Claim ID CLM-014407 - Testing was conducted by Dell Server TME with the servers located in Dell Labs during the May 2025 timeframe, The R770 server ran 2 socket GNR CPU 6714P which has 8 Cores compared to SuperMicro AS -2023US-TR4 server running 2 socket AMD EPYC 7251 CPU which has 8 cores

[3] Based on Claim ID CLM-014408 - Testing was conducted by Dell Server TME with the servers located in Dell Labs during the May 2025 timeframe, The R770 server ran 2 socket GNR CPU 6714P which has 8 Cores compared to SuperMicro AS -2023US-TR4 server running 2 socket AMD EPYC 7251 CPU which has 8 cores

[4] Based on Claim ID CLM-014451 - Testing was conducted by Dell Server TME with the servers located in Dell Labs during the May 2025 timeframe, The R770 server ran 2 socket GNR CPU 6714P which has 8 Cores compared to SuperMicro AS -2023US-TR4 server running 2 socket AMD EPYC 7251 CPU which has 8 cores