Technical Research Study

PROWESS DELL Technologies intel

Modernize and Consolidate Your Data Center with High-Performing, Efficient Servers and Processors

Research by Prowess Consulting found that Dell™ PowerEdge™ servers powered by Intel® Xeon® 6 processors with Performance-cores (P-cores) offer efficiency with high performance for diverse workloads, from general-purpose computing to AI and analytics.

Executive Summary

For modern businesses, high performance alone isn't enough. Data centers must be nimble and efficient in order to support a wide range of workloads cost-effectively. Achieving that goal requires processors and servers that offer the right combination of low-latency bandwidth, acceleration, cooling, and power use.

Research performed by Prowess Consulting found that Dell™ PowerEdge™ servers powered by Intel® Xeon® 6 processors with Performance-cores (P-cores) offer performance and efficiency for diverse workloads, including AI and analytics. In this study, commissioned by Intel and Dell Technologies, we identified several world-record benchmarks for this server/processor combination, including for overall performance and performance/watt. We also identified several benchmark wins against competitive offerings for overall performance, performance under load, and performance at idle. In addition, we found that generation-over-generation comparisons demonstrate that organizations can expect a significant jump in performance from a data center refresh.

Overall, we conclude that PowerEdge servers built with Intel Xeon 6 processors with P-cores can present businesses with a compelling option for consolidating workloads in the data center. The result is better performance, along with reduced space, power usage, and cooling costs for a lower total cost of ownership (TCO), compared to their older, existing server base.

Highlights

Dell™ PowerEdge™ R770 servers with Intel® Xeon® 6787P processors provide a **leadership performance score** among all submissions for a 2U and 2-socket rack.[1]

PowerEdge R570 servers with Intel Xeon 6787P processors provide a **leadership performance-per-watt score** among all submissions using Intel Xeon 6 processors with P-cores.[2]

PowerEdge R770 servers with Intel Xeon 6787P processors provide a **leadership performance score** for two-node configurations running VMware VMmark® 4.0.2.[3]

PowerEdge R770 servers with Intel Xeon 6787P processors provide a **leadership performance score** for SAP® Business Warehouse edition for SAP HANA® benchmarks with a two-processor server across all categories.[4]

Modern Data Centers Need to Do It All

In the age of AI and complex analytics, data center workloads have become more varied and demanding. Traditional workloads, such as virtualization, are still critical to keeping businesses running, but companies are increasingly running more demanding applications alongside their mainstream workloads. Whether they rely on AI, high-performance computing (HPC), or analytics, nearly all of these use cases put growing demands on infrastructure to deliver high levels of performance.

One way to address performance needs would be to deploy high-end systems dedicated to serving specific, demanding applications. But in the age of needing to do more with less, businesses can't just throw more servers at the problem—especially when their data center footprints are often limited. Even if infrastructure budget and space were unconstrained, organizations would still need to consider power and cooling issues in order to keep utility costs down and meet sustainability goals.

A more practical solution is to deploy efficient, flexible servers built with modern processors that are designed to take on a variety of workloads, but that still provide the sufficient headroom needed to support demanding workloads like AI. Ideally, these platforms should also enable the consolidation of servers in the data center in order to reduce power and cooling expenditures.

To see if such a server/processor combination is available today, Prowess Consulting decided to examine Dell PowerEdge servers built with Intel Xeon 6 processors.

Study Parameters

The recent release of Intel Xeon 6 processors with P-cores offers organizations more power and versatility because these CPUs are built to take on many AI and HPC workloads without the need for a dedicated GPU. Intel also touts the energy efficiency—particularly the performance per watt—of these processors. Of course, overall performance and efficiency depends not only on the CPU but also on the chassis and server components working in tandem with that CPU. For this reason, we elected to look specifically at PowerEdge servers because they incorporate design features that can enhance CPU performance by optimizing cooling and overall efficiency.

Methodology

We set out to determine what performance and efficiency advantages organizations might see from refreshing aging infrastructure with modern servers powered by Intel Xeon 6 processors. In particular, we focused on PowerEdge servers running on Intel Xeon 6700-series processors with P-cores because PowerEdge servers continue to outpace competitors in terms of market share, and because Intel Xeon 6 processors are designed specifically to address performance and efficiency for both mixed and high-performance workloads.

In this study, we examined four popular PowerEdge servers found in data centers today, and we compared them to competitors' offerings and to previous-generation PowerEdge servers. Specifically, we focused on the PowerEdge R770, PowerEdge R670, PowerEdge R570, and PowerEdge R470 servers. (See **Appendix** for full configuration details.)

Figure 1 | This study examined the 2U Dell™ PowerEdge™ R770 and PowerEdge R570 servers and the 1U PowerEdge R670 and PowerEdge R470 servers

To determine performance and efficiency for a variety of demanding workloads, we examined published test results showing both competitive and generation-over-generation improvements spanning the following workload categories:

- Power/performance, efficiency, and consolidation (including virtualization)
- HPC
- AI and machine learning (ML)
- Database/analytics

For this study, we obtained results from the following commonly used tests, benchmarks, and workloads:

- **Standard Performance Evaluation Corporation (SPEC®)** benchmarks, which are widely used in the industry to measure the performance of computer systems by running a set of applications with a specific configuration and workload. We looked at published SPEC results for power/performance, CPU performance, performance/watt/core, and power under 100% load.
- **STREAM,** which is a synthetic benchmark program that measures memory performance.
- High-performance LINPACK (HPL), which is used to measure the performance of HPC systems and is often used to rank supercomputers in the TOP500® list.
- **MLPerf®**, which is a **benchmark suite**, developed by the non-profit MLCommons, that provides an independent and objective way to evaluate the performance of ML hardware, focusing on both training and inference.
- **Product benchmarks (including VMware® solutions, the SAP HANA® platform, and Microsoft® SQL Server® databases),** which we used to measure performance for their respective workloads.
- **AI/ML workloads,** a comprehensive comparison of previous-generation PowerEdge R660 platforms against PowerEdge R670 and R770 platforms with **AI/ML use cases**.

Test Results

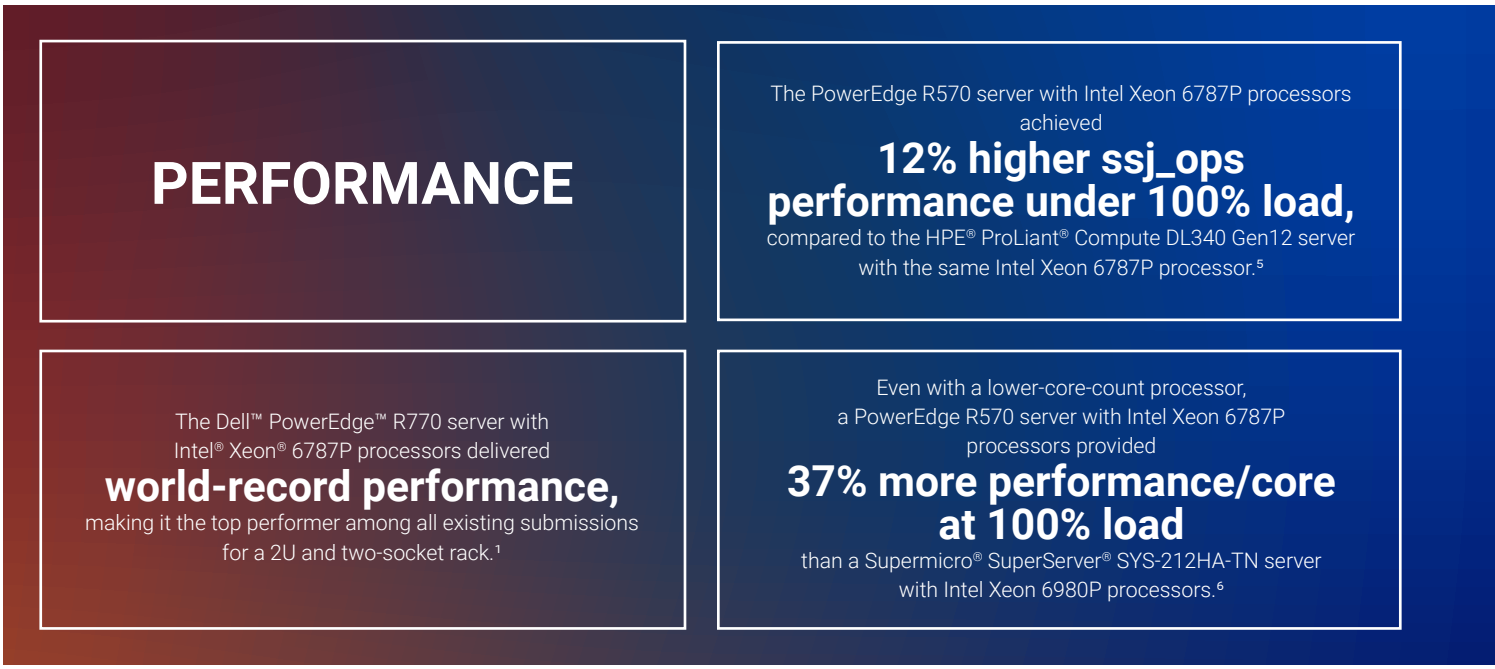
We looked at industry-standard benchmarks and tests to see how PowerEdge servers compare to the competition and to prior generations for performance and efficiency across a range of workloads.

General Performance, Efficiency, and Consolidation

We began our research by examining tests covering general performance and efficiency. This category is arguably a top priority for organizations considering a data center refresh. Enhanced server and CPU performance-per-watt enables each node to deliver sufficient computational power with minimal energy consumption. Additionally, consolidating workloads onto more efficient servers can reduce the physical space required in the data center, freeing up valuable real estate and simplifying management. By investing in high-performance, energy-efficient servers, organizations can achieve more sustainable, cost-effective, and streamlined data center operations.

Performance

We began by researching SPEC benchmarks related to overall power and performance for the PowerEdge servers and Intel Xeon 6 processors we were examining. We found several interesting results, including a world record for the SPECpower®_ssj2008 performance benchmark, which runs a standardized workload on the target server while measuring power efficiency. We also found that PowerEdge servers showed **performance advantages over both HPE® and Supermicro® servers**, with all devices running Intel Xeon 6 processors with P-cores.



In an age of doing more with less, savvy businesses should look carefully at generational improvements to determine if and when to perform a server refresh. To help provide insights on this factor, we looked at generation-over-generation performance results. **Published claims based on several SPEC benchmarks** show significant performance gains. These tests suggest users would see significant performance boosts in their systems' abilities to handle multiple floating-point operations simultaneously, which is crucial for tasks such as scientific computations, simulations, and 3D graphics rendering. In addition, generational gains from the HPL benchmark demonstrate exceptional performance for HPC workloads. Finally, the STREAM benchmark result shows the memory bandwidth gains that can be achieved with newer PowerEdge platforms powered by Intel Xeon 6 processors with P-cores.

A Dell™ PowerEdge™ R470 server with Intel® Xeon® 6747P processors offers up to

102% more compute performance

than a prior-generation PowerEdge R450 server with Intel Xeon Silver 4314 processors.[7]

A PowerEdge R770 server with Intel Xeon 6787P processors offers up to

45% more compute performance

than the previous-generation PowerEdge R760 server with Intel Xeon Platinum 8592+ processors, and up to

67% more compute performance

than a PowerEdge R760 server with Intel Xeon Platinum 8480+ processors.[8]

The PowerEdge R770 server with 86-core Intel Xeon 6787P processors offers up to

62% more HPL performance

than the previous-generation PowerEdge R760 server with 64-core Intel Xeon Platinum 8592+ processors, and up to

96% more HPL performance

than a PowerEdge R760 server with 56-core Intel Xeon Platinum 8480+ processors.[9]

The PowerEdge R770 server with Intel Xeon 6787P processors offers up to

20% more memory bandwidth

than the previous-generation PowerEdge R760 server with Intel Xeon Platinum 8592+ processors, and up to

36% more memory bandwidth

than a PowerEdge R760 server with 56-core Intel Xeon Platinum 8480+ processors.[10]

Efficiency

We then examined published power/performance benchmarks to compare overall efficiency for the PowerEdge server configurations in this study against competitor offerings and to determine generation-over-generation improvements. When comparing results from different vendors using Intel Xeon 6 processors with P-cores, we found that the Dell PowerEdge R570 server, powered by Intel Xeon 6787P processors, achieved **world-record performance per watt**.[2]

In addition to the overall world-record result, we found several published benchmarks showing direct comparisons between PowerEdge servers and Supermicro or HPE servers, all powered by Intel Xeon 6 processors with P-cores. The PowerEdge servers showed significant overall advantages in these comparisons, suggesting that Dell Technologies is able to enhance processor efficiency by housing those CPUs in chassis that better facilitate airflow, compared to other original equipment manufacturers (OEMs).

EFFICIENCY

Even with a higher memory configuration, a Dell™ PowerEdge™ R570 server with Intel® Xeon® 6787P processors provided

56% higher overall performance/watt/core

in one comparison than a Supermicro® SuperServer® SYS-212HA-TN server with Intel Xeon 6980P processors.[11]

A PowerEdge R770 server powered by Intel Xeon 6787P processors consumed

40% less power at idle

compared to an HPE® ProLiant® Compute DL380 Gen12 server powered by the same Intel Xeon 6787P processors.[12]

Even with a higher memory configuration, a PowerEdge R570 server powered by Intel Xeon 6787P processors consumed

37% less power at idle

compared to a 2U HPE ProLiant Compute DL340 Gen12 server with the same Intel Xeon 6787P processors.[13]

As with overall performance, our research uncovered **significant generation-over-generation improvements** in overall efficiency when comparing a current-generation PowerEdge server with Intel Xeon 6 processors with P-cores to a previous-generation PowerEdge server powered by 5th Gen Intel Xeon processors.

Strong performance/watt benchmark results demonstrate high levels of efficiency for the combination of PowerEdge servers with Intel Xeon 6 processors. As a result, businesses should see several benefits to their bottom lines from reductions in power and cooling. In addition, higher efficiency suggests that organizations can also benefit from consolidating servers by doing more work on each server than is possible with older generation servers or with many of the competitor servers we examined. **Benchmark results** obtained using SPECint® and SPECfp®, reinforce this advantage.

A Dell™ PowerEdge™ R770 server with
Intel® Xeon® 6787P processors provided
32% higher performance per watt
than the previous-generation PowerEdge R760 server with
Intel Xeon Platinum 8592+ processors and
65% higher performance per watt
than the previous-generation PowerEdge R760 server with
Intel Xeon Platinum 8480+ processors.[14]

A PowerEdge R770 server with
Intel Xeon 6787P processors can support up to
50% more cores per processor,
with up to
67% increased performance per CPU,
than an older-generation PowerEdge R740xd server with
Intel Xeon Platinum 8280 processors.[15]

Based on these results, an organization would be able to consolidate up to five servers that are five years old into one server today, resulting in up to 50% savings in energy costs and a reduction in greenhouse gases. This consolidation also helps slash per-core software licensing costs, which are typically 40%.[15]

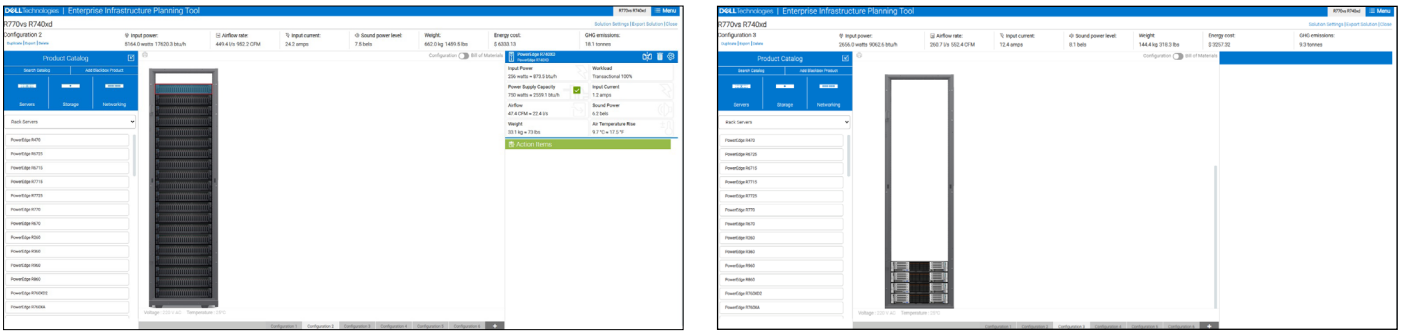


Figure 2 | The **Dell™ Enterprise Infrastructure Planning Tool** can be used to estimate consolidation, power, cooling, and energy savings that can be achieved by upgrading to newer Dell™ PowerEdge™ servers built on Intel® Xeon® 6 processors with P-cores

We elected to go one step deeper into evaluating potential consolidation benefits by looking at **VMware VMmark® 4 benchmark results**. This benchmark uses a tile-based heterogeneous workload application design that runs several application workloads that closely represent enterprise virtualization environments. We found that the current-generation PowerEdge server with Intel Xeon 6 processors with P-cores delivered world-record performance in its category.

A Dell™ PowerEdge™ R770 server delivers
world-record performance
for two-node configurations running VMware VMmark® 4.0.2 with Intel® Xeon® 6787P processors.[3]

This result further cements the argument that the combination of newer-generation PowerEdge servers with Intel Xeon 6 processors can help virtualized workloads run efficiently, providing organizations with both flexibility and consolidation opportunities in the data center.

Performance by Workload

In addition to the VMmark benchmark, we looked at available published benchmarks for other workloads that are commonly run in business data centers. These included several benchmarks focused on HPC, AI, and database/analytics.

HPC and AI

HPC and AI workloads demand higher performance compared to traditional workloads. In some cases, systems with dedicated GPUs might be required, especially for many ML training use cases. But with the release of Intel Xeon 6 processors with P-cores, Intel states that organizations can not only run many AI and HPC workloads effectively, they can even run them alongside other workloads for increased efficiency and consolidation.

These HPC and AI performance boosts are due to several accelerators baked into the Intel® CPUs, including built-in matrix engines that accelerate compute-intensive data services workloads. These accelerators include **Intel® QuickAssist Technology (Intel® QAT)** and **Intel® Data Streaming Accelerator (Intel® DSA)**. **Intel® Advanced Matrix Extensions (Intel® AMX)** is particularly useful for accelerating AI workloads because the latest release of Intel Xeon 6 processors with P-cores supports INT8, BF16, and FP16 data types.

Based on our research of published benchmark results, we conclude that the accelerators found in Intel Xeon 6 processors with P-cores do indeed boost performance compared to prior-generation Intel Xeon processors, as indicated by the following **MLPerf benchmark test**. MLPerf measures how fast a system can perform ML inference using a trained model with new data in a variety of deployment scenarios.

We also uncovered several examples of OpenVINO™ benchmarks run on Phoronix Test Suite™ that also demonstrate generation-over-generation performance gains for the newer processors running on the latest-generation PowerEdge servers.

With enhanced Intel® AMX with support for new FP16 instructions, the Dell™ PowerEdge™ R670 server with Intel® Xeon® 6787P processors delivers up to

1.5x greater performance

than a PowerEdge R760 server with previous-generation Intel Xeon Platinum 8592+ processors, as measured using the industry-standard MLPerf® 5.0 benchmark.[16]

AI/ML: The PowerEdge R470 server with Intel Xeon 6781P processors provides up to

12x more frames per second (FPS)

for video-streaming AI models, compared to a PowerEdge R550 server with Intel Xeon Gold 5317 processors, when running the OpenVINO™ benchmark on Phoronix Test Suite™.[17]

Virtualization: The PowerEdge R470 server with Intel Xeon 6781P processors delivers

up to 77% more FPS

than a PowerEdge R550 server with Intel Xeon Gold 5317 processors, when running the OpenVINO benchmark on Phoronix Test Suite.[18]

Overall performance: The PowerEdge R470 server with Intel Xeon 6781P processors provides up to

9x more FPS per watt

than a PowerEdge R550 server with Intel Xeon Gold 5317 processors, when running the OpenVINO benchmark on Phoronix Test Suite.[19]

Database/Analytics

Databases often make up the backbone of business applications because they process both customer-facing data and internal data used to generate actionable insights for the organization. Reliable, low-latency performance is critical for meeting customer expectations and for rapidly handling data used for internal processes.

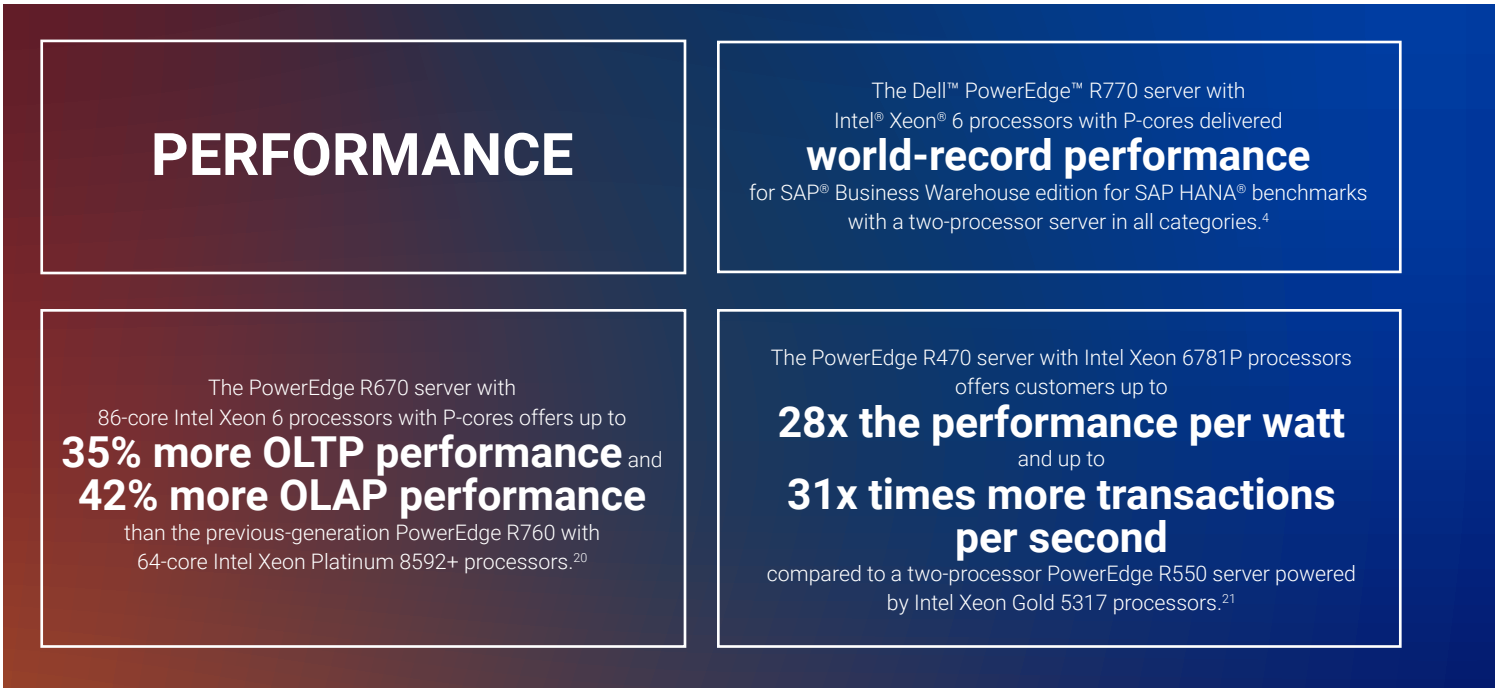
Our research indicates that the low-latency design and built-in accelerators offered with Intel Xeon 6 processors with P-cores should benefit databases in the same way that they improve performance for AI and HPC. In particular, **Intel® In-Memory Analytics Accelerator (Intel® IAA)** is designed specifically to help optimize analytics performance by offloading compression, decompression, and other compute-intensive tasks from the CPU. This suggests that in-memory databases like the SAP HANA platform would benefit from the newer-generation processors.

Figure 3 | Intel® Xeon® 6 processor with P-cores

We confirmed this supposition by identifying an **SAP HANA benchmark** result showing world-record performance for the latest-generation PowerEdge servers powered by two Intel Xeon 6 processors with P-cores.

We then expanded our research beyond SAP HANA to include published benchmarks for more commonly used SQL online transaction processing (OLTP) and online analytical processing (OLAP) workloads. Once again, we **found significant performance gains over the prior generation**, demonstrating that the combination of newer PowerEdge servers and Intel CPUs can handle both real-time transactions and complex database analysis much more efficiently than previous generations.

Finally, we looked at a PostgreSQL® benchmark result that shows both strong overall transaction performance and greater performance/watt for a newer-generation PowerEdge server with Intel Xeon 6 processors with P-cores, compared to the prior-generation server and processor combination.



Unique Power and Efficiency Features in PowerEdge Servers

As several of the benchmark results show, PowerEdge servers frequently outperform competitors even when both are equipped with the same Intel Xeon processors. Several factors contribute to these performance gains. For example, compared to the previous generation, the PowerEdge R670/R770 servers and PowerEdge R470/R570 servers offer faster DDR5 memory, providing higher bandwidth and lower latency compared to DDR4 memory.

Perhaps the greatest differentiation comes from cooling features, such as an optimized airflow chassis that is designed to maximize air cooling capabilities. Features like component-mapped fan zoning, intelligent fan controls and Dell™ Smart Flow strategic airflow channeling target areas in the servers that need cooling the most. These features reduce hot spots and help maximize peak performance efficiently. In addition, PowerEdge servers include advanced CPU heatsink designs and optimized motherboard layouts to further streamline temperature regulation. These enhancements can help maximize performance without thermal throttling.

The Integrated Dell™ Remote Access Controller (iDRAC), which enables real-time monitoring and control of servers, can be combined with the Dell™ OpenManage™ Enterprise Power Manager plugin. Together, these tools provide granular power and thermal monitoring, with the ability to report, cap, and optimize power consumption at the server, rack, row, or full data center level.

Additionally, the 17th generation Dell PowerEdge servers we examined offer iDRAC10, which provides several new advanced features over iDRAC9, including:

- 64-bit CPU architecture, versus 32-bit architecture in the previous generation, for quicker response times and more efficient processing

- Improved security, with stronger encryption, an integrated root-of-trust (RoT), and device-level attestation
- Supply chain assurance via a Secured Component Verification (SCV) firmware certificate
- iDRAC direct improved connectivity via a USB-C® hardware port
- Support for the Dell™ Cloud Health Monitoring Service, which provides administrators with real-time monitoring, predictive analytics, and comprehensive reporting capabilities
- An enhanced user interface (UI) for easier navigation and management

While beyond the scope of this study, these tools offer the capability to help drive overall performance, security, energy efficiency, and cost savings in the data center.

Choose Efficiency with Performance

Based on our examination of benchmark and workload scores, we determined PowerEdge R770/R670 servers and PowerEdge R570/470 servers powered by Intel Xeon 6 processors with P-cores to be outstanding options for businesses looking to modernize their data centers. These servers offer a compelling combination of overall performance, in addition to performance/watt efficiency, making them ideal for organizations deploying mainstream workloads alongside AI, HPC, and analytics workloads. And because of their high levels of efficiency, organizations can use these platforms to consolidate servers in the data center, resulting in reduced power, cooling, and management costs for a lower TCO.

Appendix

Tables 1 and 2 show the PowerEdge servers referenced in this study.

Table 1 | 17th generation Dell™ PowerEdge™ server form factors, sockets, and processor support

17th Generation Dell™ PowerEdge™ Servers				
Server	**PowerEdge R770**	**PowerEdge R670**	**PowerEdge R570**	**PowerEdge R470**
Form factor	2U	1U	2U	1U
Sockets	2S	2S	1S	1S
Intel® CPU options	Two Intel® Xeon® 6 processors with up to 144 Efficient-cores (E-cores) or 86 P-cores per processor	Two Intel® Xeon® 6 processors with up to 144 E-cores or 86 P-cores per processor	One Intel® Xeon® 6 processor with up to 144 E-cores or one Intel Xeon 6 processor with up to 86 P-cores with an R1S option	One Intel® Xeon® 6 processor with up to 144 E-cores per processor or one Intel Xeon 6 processor with up to 86 P-cores with an R1S option

Table 2 | 16th, 15th, and 14th generation Dell™ PowerEdge™ server form factors, sockets, and processor support

	16th Generation Dell™ PowerEdge™ Servers	15th Generation Dell™ PowerEdge™ Servers		14th Generation Dell™ PowerEdge™ Servers
Server	PowerEdge R760	PowerEdge R550	PowerEdge R450	PowerEdge 740xd
Form factor	2U	2U	1U	2U
Sockets	2S	2S	2S	2S
Intel® CPU options	Up to two 4th Gen Intel® Xeon® Scalable processors or Intel Xeon Max processors with up to 56 cores per processor and with optional Intel® QAT, or up to two 5th Gen Intel Xeon processors with up to 64 cores per processor	Up to two 3rd Gen Intel® Xeon® Scalable processors with up to 24 cores per processor	Up to two 3rd Gen Intel® Xeon® Scalable processors, with up to 24 cores per processor	Up to two Intel® Xeon® processors, with up to 28 cores per processor

For more details on the tests, benchmarks, and workloads in this study, see the following resources on the Dell Technologies Info Hub website:

- SAP HANA benchmark: **https://infohub.delltechnologies.com/it-it/p/new-sap-bw-edition-for-sap-hana-benchmarks-world-record-with-intel-r-xeon-r-6-processors-with-p-cores/**
- VMware benchmark: **https://infohub.delltechnologies.com/it-it/p/dell-poweredge-r770-leads-in-vmmark-performance-with-intel-6th-gen-p-core-cpus/**
- MLPerf benchmark: **https://infohub.delltechnologies.com/it-it/p/mlperf-tm-inference-v5-0-performance-on-dell-poweredge-r670-with-intel-r-6th-gen-p-core-cpus/**
- 67% compute performance improvement: **https://infohub.delltechnologies.com/en-us/p/dell-poweredge-2-socket-r770-670-achieves-up-to-67-performance-improvement-with-intel-r-6th-gen-p-core-cpus/**
- 102% compute performance improvement: **https://infohub.delltechnologies.com/en-us/p/dell-poweredge-r570-r470-achieves-up-to-102-performance-improvement-with-intel-r-6th-gen-p-core-cpus/**
- World-record performance per watt: **https://infohub.delltechnologies.com/en-us/p/dell-poweredge-r570-achieves-world-record-performance-per-watt-with-intel-r-6th-gen-p-core-cpus/**
- 65% performance-per-watt improvement: **https://infohub.delltechnologies.com/en-us/p/dell-poweredge-r770-achieves-up-to-65-performance-per-watt-improvement-with-intel-r-6th-gen-p-core-cpus/**
- SQL Server test results: **https://infohub.delltechnologies.com/en-us/p/dell-poweredge-r670-delivers-up-to-42-improvement-in-sql-server-test-results-using-intel-r-6th-gen-cpus/**
- AI/ML workloads: **https://infohub.delltechnologies.com/en-us/t/dell-poweredge-r670-and-r770-platforms-with-intel-r-xeon-6-cpus-deliver-cutting-edge-performance-per-watt-in-ai/**

Endnotes

[1] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.spec.org/power_ssj2008/results/** on March 10, 2025, for Dell™ PowerEdge™ R770 servers with 86-core Intel® Xeon® 6787P processors, which achieved the highest ssj_ops (24,658,201) out of all the existing submissions on for a 2U and two-socket rack server.

[2] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.spec.org/power_ssj2008/results/** on March 10, 2025, for Dell™ PowerEdge™ R570 servers with 86-core Intel® Xeon® 6787P processors, which achieved an average performance/watt score of 21,089, compared to all submissions on 2U, one-socket servers with Intel Xeon 6787P CPUs.

[3] Based on Dell testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.vmware.com/products/vmmark/results4x** on March 18, 2025, for Dell™ PowerEdge™ R770 servers with 86-core Intel® Xeon® 6787P processors, which achieved a score of 3.34 at 4.2 tiles on VMware VMmark® 4, compared to a PowerEdge R760 servers with 64-core Intel Xeon 8592+ processors, which achieved a score of 2.50 at 3 tiles on February 4, 2025. Actual results may vary.

[4] SAP® BW Edition benchmark version 3 for all Intel® servers running Linux® and SAP HANA® 3.0, with 3.9B initial records, as of February 24, 2025. Performance results for the Dell™ PowerEdge™ R770 server (2 x Intel® Xeon® 6787P processor, 2.0 GHz, 172 cores, 344 threads, 1,024 GB memory, running SAP HANA 3.0), certification number 2025004. Benchmark phase 1: number of initial records: 3,900,000,000; runtime of last dataset (seconds): 6,835; benchmark phase 2 query executions per hour: 11,685; benchmark phase 3, total runtime for complex query phase (seconds): 73.

[5] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.spec.org/power_ssj2008/results/** on March 10, 2025, for Dell™ PowerEdge™ R570 servers with 86-core Intel® Xeon® 6787P processors, which achieved ssj_ops of 12,828,833, compared to HPE® ProLiant® Compute DL340 Gen12 servers with the same Intel Xeon 6787P processors (2U and one-socket) with ssj_ops of 11,443,968.

[6] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.spec.org/power_ssj2008/results/** on March 10, 2025, for Dell™ PowerEdge™ R570 servers with 86-core Intel® Xeon® 6787P processors, which achieved ssj_ops at 100% load of 12,828,833, compared to Supermicro® SuperServer® SYS-212HA-TN servers with 128-core Intel Xeon 6980P processors (2U and one-socket), which achieved 13,964,348.

[7] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.spec.org/cpu2017/results/** on March 10, 2025, for Dell™ PowerEdge™ R470 servers with 48-core Intel® Xeon® 6747P processors, with a CPU floating point (FP) rate base score of 646, compared to PowerEdge R450 servers with 48-core Intel Xeon Silver 4314 processors, with a score of 328.

[8] Based on Dell Technologies testing with servers at Dell Performance Labs on March 10, 2025, for Dell™ PowerEdge™ R770 servers with 86-core Intel® Xeon® 6787P processors, with a CPU INT rate base of 1,550, compared to PowerEdge R760 servers with 64-core Intel Xeon Platinum 8592+ processors, with a score of 1,070, and compared to PowerEdge R760 servers with 56-core Intel Xeon Platinum 8480+ processors, with a score of 976.

[9] Based on Dell Technologies testing with servers at Dell Performance Labs on March 10, 2025, for Dell™ PowerEdge™ R770 servers with 86-core Intel® Xeon® 6787P processors, with LINPACK performance of 12,451.5 GFLOPS/s, compared to PowerEdge R760 servers with 64-core Intel Xeon 8592+ processors, with LINPACK performance of 7,691 GFLOPS/s, and compared to PowerEdge R760 servers with 56-core Intel Xeon Platinum 8480+ processors, with LINPACK performance of 6,364 GFLOPS/s.

[10] Based on Dell Technologies testing with servers at Dell Performance Labs on March 10, 2025, for Dell™ PowerEdge™ R770 servers with 86-core Intel® Xeon 6787P processors, with STREAM bandwidth of 674,178.6, compared to PowerEdge R760 servers with 64-core Intel Xeon Platinum 8592+ processors, with STREAM bandwidth of 559,337, and compared to PowerEdge R760 servers with 56-core Intel Xeon Platinum 8480+ processors, with STREAM Bandwidth of 496,373.

[11] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.spec.org/power_ssj2008/results/** on March 10, 2025, for Dell™ PowerEdge™ R570 servers with 86-core Intel® Xeon® 6787P processors, which achieved overall performance/watt of 21,089, compared to Supermicro® SuperServer® SYS-212HA-TN servers with 128-core Intel Xeon 6980P processors (2U and one-socket), which achieved performance/watt of 20,102.

[12] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.spec.org/power_ssj2008/results/** on March 10, 2025, for Dell™ PowerEdge™ R770 servers with 86-core Intel® Xeon® 6787P processors, which achieved idle power of 157 watts, compared to HPE® ProLiant® Compute DL380 Gen12 servers with the same Intel Xeon 6787P processors (2U and two-socket), which achieved idle power of 220 watts.

[13] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.spec.org/power_ssj2008/results/** on March 10, 2025, for Dell™ PowerEdge™ R570 servers with Intel® Xeon® 6787P processors, which consumed 37% less power at idle (90 watts versus 123 watts), compared to a 2U HPE® ProLiant® Compute DL340 Gen12 server with Intel Xeon 6787P processors.

[14] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.spec.org/power_ssj2008/results/** on March 10, 2025, for Dell™ PowerEdge™ R770 servers with 86-core Intel® Xeon® 6787P processors, which achieved overall performance/watt of 21,232, compared to PowerEdge R760 servers with 2 x Intel Xeon Platinum 8592+ processors, which achieved overall performance/watt of 16,137, and compared to PowerEdge R760 servers with 2 x Intel Xeon Platinum 8480+ processors, which achieved overall performance/watt of 12,864.

[15] Based on Dell Technologies analysis comparing the SPECint® and SPECfp® scores of the Dell™ PowerEdge™ R770 server with Intel® Xeon® 6787P processors (1,550 and 1,560) with the same scores for a PowerEdge R740xd server with Intel Xeon Platinum 8280 processors (375 and 296). The ratio of the scores shows that five PowerEdge R740xd servers would give a total score similar to that for the single PowerEdge R770 server, as configured here. The energy costs and greenhouse gasses are calculated from the Dell Technologies Enterprise Infrastructure Planning Tool (EIPT), available at **https://dell-ui-eipt.azurewebsites.net/#/**. Actual performance will vary. SPEC® results submitted on March 10, 2025, were completed in Dell Performance Labs.

[16] Based on Dell Technologies testing with servers at Dell Performance Labs and publicly available performance results submitted on **www.mlperf.org** on February 28, 2025, for Dell™ PowerEdge™ R670 servers with 86-core Intel® Xeon® 6787P processors, which achieved up to 1.5x performance on GPT-J 99.9, compared to PowerEdge R760 servers with 64-core Intel Xeon Platinum 8592+ processors. Actual results may vary.

[17] Based on Dell Technologies testing with servers at Dell Performance Labs in March 2025 for Dell™ PowerEdge™ R470 servers with 80-core Intel® Xeon® 6781P processors, compared to PowerEdge R550 servers with 2 x 12-core Intel Xeon Gold 5317 processors using the OpenVINO™ AI/ML benchmark in the Phoronix Test Suite™.

[18] Based on Dell Technologies testing with servers at Dell Performance Labs in March 2025 for Dell™ PowerEdge™ R470 servers with 80-core Intel® Xeon® 6781P processors, compared to PowerEdge R550 servers with 2 x 12-core Intel Xeon Gold 5317 processors using the OpenVINO™ virtualization benchmark on Phoronix Test Suite™.

[19] Based on Dell Technologies testing with servers at Dell Performance Labs in March 2025 for Dell™ PowerEdge™ R470 servers with 80-core Intel® Xeon® 6781P processors, compared to PowerEdge R550 servers with 2 x 12-core Intel Xeon Gold 5317 processors using the OpenVINO™ overall performance benchmark on Phoronix Test Suite™.

[20] Based on Intel testing with servers at Dell Performance Labs in February 2025 for Dell™ PowerEdge™ R770 servers with 86-core Intel® Xeon® 6787P processors, with 3,814,712 TPROC-C new orders per minute (NOPM) and 3,354.2 TPROC-H queries per hour, compared to a PowerEdge R760 server with 64-core Intel Xeon Platinum 8592+ processors, with 2,831,172 NOPM and 2,363.17 queries per hour.

[21] Based on Dell Technologies testing with servers at Dell Performance Labs in March 2025 for Dell™ PowerEdge™ R470 servers with 80-core Intel® Xeon® 6781P processors, compared to PowerEdge R550 servers with 2 x 12-core Intel Xeon Gold 5317 processors, using the PostgreSQL® pgbench benchmark on Phoronix Test Suite™.

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