

Modernize your data center to reduce costs, improve performance, and strengthen security with Dell PowerEdge servers + AMD EPYC™ processors

Infrastructure modernization with latest-generation PowerEdge servers and 5th Generation AMD EPYC™ processors

- **Up to 68.6% faster analytics** compared to legacy clusters¹
- **13:1 server consolidation** for online transaction processing (OLTP) database workloads²
- **80% reduction** in SQL Server licensing costs using high-core systems³
- **61.2% less power usage** replacing seven legacy servers with one latest-gen server⁴
- **No performance degradation** from enabling modern security features⁵
- **Support for advanced cooling** including Smart Flow and direct liquid cooling

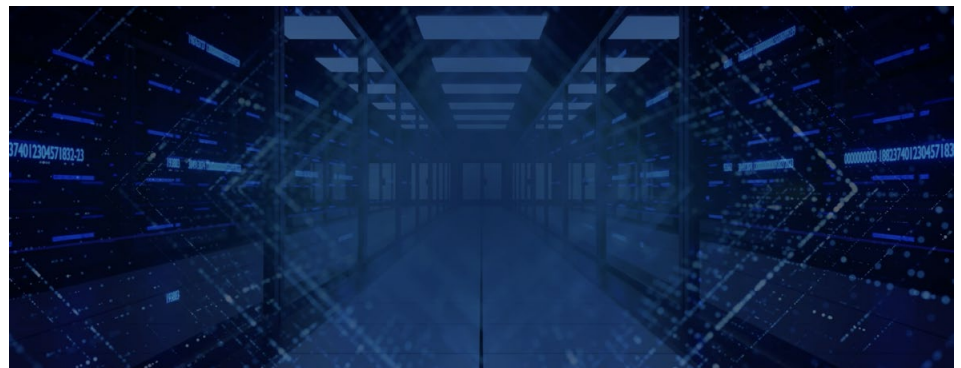
Industry trends and challenges

As data volumes surge and compute-intensive workloads, such as artificial intelligence (AI), analytics, and virtualization, become core to business strategy, legacy systems may struggle to keep up with changes. Servers deployed five or more years ago were not designed for the scale, complexity, or security requirements of modern workloads.

Rising energy costs and stricter sustainability mandates are simultaneously pushing IT teams to reconsider power usage, cooling efficiency, and their organizations' data center footprints. Infrastructure decisions must factor in performance and costs—both capital and operating expenditure (CapEx and OpEx)—while maximizing value in energy efficiency, workload density, and long-term scalability.

In addition, aging infrastructure introduces growing risks. Older hardware often cannot match the performance-per-watt or core density of newer systems, which can result in overprovisioned environments that are harder to manage and more expensive to license. Security vulnerabilities also increase as infrastructure ages, with some older firmware and management tools lacking modern zero-trust frameworks.

Given all these factors, the necessity of modernization is clear. Infrastructure refresh initiatives enable IT leaders to consolidate more workloads onto fewer servers, reduce operational costs, and prepare for AI and other compute-intensive workloads.



Aging infrastructure can drive up costs and introduce risks

Aging servers quietly accumulate technical debt in the data center, introducing inefficiencies that raise operational costs and risks over time. The longer hardware remains active, the more hidden expenses can stack up, including:

- **Excessive licensing per core:** Legacy systems typically deliver less performance per core, leading to more licenses, such as those for Microsoft SQL Server or VMware vSphere. This results in more licenses to do the same amount of work as newer servers and can cost more, comparatively.
- **Underutilized capacity:** Older servers can run below their performance ceiling, typically for isolated workloads or peak redundancy. This underutilization can result in stranded resources and bloated infrastructure.
- **Fragmented workload sprawl:** Incremental, reactive server additions over time can lead to an overly distributed infrastructure that is difficult to manage.
- **Rising support costs:** Legacy components can be more prone to failure and less efficient to service after years of regular, consistent use. Keeping older servers running can cost more in the long run not only due to repairs, but because of the additional time required by IT staff to maintain aging systems.
- **Missed firmware security protections:** Older servers may lack more recent firmware-level defenses, such as secure boot, hardware root of trust, and silicon-to-OS chain of trust verification.
- **Outdated cooling profiles:** Legacy systems may rely on airflow models and component designs that predate today's high-density workloads.

Additionally, all these factors can compound over time. The costs of stranded compute, inefficient licensing, increased energy use, and security exposure often outweigh the perceived savings from deferring a refresh. Investing in the latest Dell PowerEdge servers powered by 5th Gen AMD EPYC processors can be more than a technical upgrade: it can be a transformative corrective against years of accumulated inefficiency.

Latest-gen PowerEdge servers featuring 5th Gen AMD EPYC processors

Single-socket



Dell PowerEdge R6715



Dell PowerEdge R7715

Dual-socket



Dell PowerEdge R6725



Dell PowerEdge R7725 / R7725xd

Modern platforms for today's workloads

Today's enterprise workloads demand more from infrastructure—higher performance per core, greater memory bandwidth, faster storage access, and more efficient use of power and cooling resources. Modern server platforms are engineered to meet these demands head-on, integrating features that enable organizations to scale efficiently while reducing total cost of ownership.

The latest generation of Dell PowerEdge servers with 5th Gen AMD EPYC processors offer:

- **High core density:** Up to 192 cores per socket to consolidate more workloads onto fewer systems, reducing software licensing and rack space requirements.
- **Memory and I/O throughput:** Support for DDR5 memory and PCIe Gen5 to keep data moving at high speed between CPUs, memory, and accelerators.
- **Flexible accelerator options:** GPU-ready configurations that support AI training, inference, and HPC workloads at scale.
- **Advanced thermal design:** Options for Smart Flow air cooling or direct liquid cooling to maintain performance in high-density deployments while lowering cooling costs.
- **Security at the foundation:** Hardware root of trust, secure boot, and cryptographic firmware verification to protect the server from the silicon to the operating system.

This combination of compute power, architectural flexibility, and energy-conscious design makes these systems an ideal foundation for modernizing workloads—whether the goal is to accelerate analytics, expand virtualization capacity, or prepare the data center for emerging AI applications.

Table 1. Latest-gen PowerEdge models featuring 5th Gen AMD EPYC processors.

PowerEdge server model	Suggested workloads	Processor	GPUs	Cooling options	Max core count
R6715	Virtualization, HCI, and network function virtualization (NFV)	Single-socket 5th Generation AMD EPYC 9005 series	Up to 3x single-width	Air and liquid	160
R7715	AI, software-defined storage (SDS), dense virtualization, and data analytics	Single-socket 5th Generation AMD EPYC 9005 series	Up to 6x single-width Up to 3x double-width	Air and liquid	160
R6725	AI, HPC, dense VDI, and virtualization	Dual-socket 5th Generation AMD EPYC 9005 series	Up to 3x single-width	Air and liquid	192
R7725	AI, data analytics, all-flash SDS, and VDI	Dual-socket 5th Generation AMD EPYC 9005 series	Up to 6x single-width Up to 2x double-width	Air and liquid	192
R7725xd	SDS, data analytics	Dual-socket 5th Generation AMD EPYC 9005 series	N/A	Air	192

Modernization benefits of latest-gen Dell PowerEdge servers with 5th Gen AMD EPYC processors

Recent benchmark testing shows how upgrading to latest-gen Dell PowerEdge servers with 5th Gen AMD EPYC processors can yield measurable improvements in performance, efficiency, and workload scalability:

- **Analytics at scale:** A 96-core PowerEdge R7715 cluster completed nine database workloads 68% faster using only 62% of available compute—room for six additional analytics VMs with no per-VM performance loss.⁶
- **More transactional databases:** A PowerEdge R7725 delivered a 62.9% increase in transactions per minute (TPM) per core in OLTP workloads compared to older systems.⁷
- **Support for storage-intensive workloads:** The PowerEdge R7725xd supports up to 24 U.2 Gen5 NVMe SSD bays—offering massive capacity for object or block storage within a single chassis.
- **HPC and AI acceleration:** Configurations supporting up to six single-width or three double-width GPUs make these systems well-suited for machine learning training, high-performance computing, and inference workloads.
- **Virtualization scalability:** A PowerEdge R7725 achieved a world-record VMmark 4.0 score of 7.28 tiles in the 2-node, 2-socket server category, demonstrating the ability to host more VMs and increase workload density without performance compromise.⁸
- **AI readiness:** A GPU-backed PowerEdge server ran the MLPerf 3D-Unet benchmark 19% faster than a previous-generation PowerEdge server with the same GPUs, underscoring the performance headroom modern hardware can provide even with accelerators.⁹
- **Top AI model performance:** A PowerEdge R6715 recorded the best TPCx-AI v2 score in its test group for a scale factor 10 workload, showing the ability to execute end-to-end AI training and inference efficiently.¹⁰
- **Support for LLM workloads:** A PowerEdge server supported up to 136 concurrent Llama 3.1 405B chatbot sessions in testing with AMD Instinct™ MI300X GPU accelerators, demonstrating support for GenAI deployments.¹¹

By consolidating workloads, accelerating time-to-insight, and enabling high-density configurations, these PowerEdge platforms can deliver both immediate ROI and long-term scalability—positioning IT teams to handle today's demands and tomorrow's innovations with equal confidence.

Cooling & sustainability advantages

As workloads grow in density and complexity, thermal management becomes a critical factor in both performance stability and operational cost control. PowerEdge servers integrate advanced cooling technologies that enable higher efficiency, extended component lifespan, and reduced environmental impact:

- **Smart Flow air** cools up to 17% more cubic feet per minute than traditional designs.¹²
- **Direct liquid cooling** keeps CPUs cooler than air cooling alone, even at 35°C.¹³
- Additionally, many systems have earned the **EPEAT Silver rating**, meeting stringent environmental performance criteria.¹⁴



Conclusion

Modernizing with the latest Dell PowerEdge servers powered by 5th Gen AMD EPYC processors offers a way to counteract years of accumulated inefficiencies from legacy servers while preparing the data center for emerging workloads. From improved performance and consolidation potential to advanced thermal design and sustainability gains, latest-gen PowerEdge platforms deliver measurable business value. Organizations that refresh aging infrastructure today can reduce costs, improve security, and position themselves for future growth.

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