DELL Technologies

Guide

Five ways that Dell PowerEdge servers with AMD processors power the modern data center

Drive Innovation Forward

5

No-compromise performance

Powerful capabilities

Low TCO

Simplified management

End-to-end security

1 | No-compromise performance

Industry-leading 4th Generation AMD EPYC™ processors deliver best-in-class performance and efficiency for a variety of workloads including artificial intelligence (AI), databases and Java® applications.

- ✓ **Up to 121%** higher performance comparing 96-core top-of-stack AMD EPYC 4th Gen processor with 64-core AMD EPYC 3rd Gen processor using SPECCPU[1]
- ✓ **Up to 159%** increased performance per kilowatt going from an R7515 with 64-core AMD EPYC 3rd Gen to R7615 with 96-core AMD EPYC 4th Gen processors.[2]
- ✓ **Up to 34%** improved performance per core for virtualization comparing the 64-core AMD EPYC 3rd Gen processor with the 96-core AMD EPYC 4th Gen processor using VMmark®.[3]

[1] Based on Dell analysis of submitted SPECFPRate score of 1410 achieved on a Dell PowerEdge R7625 with AMD Epyc 9654s compared to the previous high score of 636 on a Dell PowerEdge R7525 with AMD Epyc 7763 processors as of 11/3/2022. Actual performance will vary.

[2] Based on Dell analysis, in June 2023, of VMMark Performance Per Kilowatt score of 21.0179 achieved on a PowerEdge R7615 2-node cluster with AMD EPYC 4th Gen 9654P processors compared to a prior score of 8.1263 achieved on an R7515 2-node cluster with AMD EPYC 3rd Gen 7763 processors. Actual performance may vary.

[3] Based on Dell analysis, in September 2023, of VMmark 3.x server performance score of 40.51 achieved on a PowerEdge R7625 2-node cluster with AMD EPYC 4th Gen 9654 processors with 96 cores each for a total of 384 cores, compared to a prior score of 20.04 achieved on an R7525 2-node cluster with AMD EPYC 3rd Gen 7763 processors with 64 cores each for a total of 256 cores. Actual performance may vary.

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2 | Powerful capabilities of new PowerEdge servers with 4th Generation AMD EPYC processors

The portfolio of new PowerEdge servers delivers a perfect balance of leading-edge performance and TCO:

			
R6615	R7615	R6625	R7625
1 socket 1U rack server offers peak performance and excellent TCO.	1 socket 2U rack server offers peak performance and excellent TCO.	2 socket 1U rack server offers peak performance and excellent TCO.	2 socket 2U rack server offers peak performance and excellent TCO.
One-socket racks		**Two-socket racks**	

New PowerEdge servers with 4th Generation AMD EPYC processors are fully optimized to outperform the competition, with one- and two-socket servers that include:

✓ Up to 96 Zen4 cores for maximum performance. Up to 128 Zen4c cores for efficiency with cloud-native use cases.[4]

✓ 50% more memory channels with up to 12 DDR5 channels per socket running at 24GT/s[5]

✓ All new PCIe Gen5 with 2X the bandwidth of PCIe Gen4[6]

✓ Up to 64% savings in CPU power[7]

✓ Up to 40% savings in VMware® vSphere® licensing[7]

3 | Low TCO that doesn't sacrifice performance

Powerful 4th Generation AMD EPYC processors reduce the number of servers required to run traditional applications, lowering power consumption and licensing costs while increasing support for VMs per 1U.

✓ Dell was able to easily and quickly migrate 380 VMs from five legacy servers with dual 28 core Intel® 8180 processors to a single R7625 with dual 96 core processors. This migration was done in under one hour using the VMware Architecture Migration Tool (VAMT). Such a consolidation achieves significant savings, including 64% reduced power for just the processors. This new setup would also need 40% fewer VMware licenses. VMmark was used to ensure that the performance per VM remained similar.[8]

✓ Achieve up to 232% higher performance/watt and up to 93% higher performance/watt/core after upgrading from a 3-5-year-old system.[9]

[4] Based on Dell analysis, in September 2023, of published specifications of the AMD EPYC 4th generation processors. AMD EPYC™ 9004 Series Server Processors | AMD.

[5] Based on published details of the AMD EPYC 3rd Generation with 8 DDR4 memory channels per socket compared to 12 DDR5 memory channels for the AMD EPYC 4th Generation processors. Additionally, the DDR5 specification states that each channel runs at 24GT/s.

[6] Based on the specifications of the latest generation of Dell PowerEdge servers clarifying support for PCIe gen5. Additionally, the PCI-sig specifications showcase the bandwidth of PCIe Gen4 at 16 GT/s and PCIe Gen5 at 32 GT/s, which is double that of PCIe Gen4

[7] Based on Dell testing using the VMware VAMT tool to migrate 380 VMs from 5x 2U servers with Intel Xeon® 8180 processors (TDP: 205 W) to 1 Dell PowerEdge R7625 server with the AMD EPYC 4th Gen 9654 (TDP: 360 W) processors on 11/5/2022. Total CPU TDP of 10x Xeon 8180 processors is 2050 W. Total CPU TDP of 2x EPYC 9654 processors is 720W. The difference is 64% savings in power. VMware vSphere licensing is based on multiples of 32 cores per socket. 5x servers with 2x Xeon 8180 processors would need 10 licenses. 1x server with 2x EPYC 9654 processors would need six licenses, which is a 40% savings. Actual results will vary depending on actual product configuration, usage, operating conditions, power management settings and other factors.

[8] Based on Dell testing using the VMware VAMT tool to migrate 380 VMs from 5x 2U servers with Intel Xeon 8180 processors (TDP: 205 W) to one Dell PowerEdge R7625 server with the AMD EPYC 4th Gen 9654 (TDP: 360 W) processors on 11/5/2022. Actual results will vary depending on actual product configuration, usage, operating conditions, power management settings and other factors.

[9] Prowess Consulting, Harness Increased Performance, Efficiency, and Lower TCO with Dell PowerEdge Powered by AMD, commissioned by Dell Technologies. August 2023.

4 | Simplified management, one comprehensive view

Built into every PowerEdge server, OpenManage Enterprise and iDRAC enable users to easily manage servers, OS and hypervisors from a single screen, anywhere in the cloud, significantly reducing deployment and update times for new levels of:

Simplicity

Intuitive and easy-to-use tools that drive out complexity of infrastructure management

Efficiency

Accelerating infrastructure management while providing infrastructure as code (IaC) support for orchestration

Availability

Creating “always on” environments that are highly resilient

Support

ProSupport Enterprise Suite aligns with the criticality of your systems, complexity of your environment and how you allocate your IT resources.

5 | End-to-end security you can trust

PowerEdge Servers incorporate advanced security features designed to help you take control while minimizing risks to critical assets.

Secure root of trust technology

Monitors whether the initial BIOS software is booted without corruption

Secure Encrypted Virtualization (SEV)

Helps protect confidentiality by encrypting each virtual machine with a unique key that is known only to the processor

Secure Memory Encryption (SME)

Makes it possible to encrypt the contents of main memory with only a change in BIOS settings

Secure data at rest

Dell OpenManage Secure Enterprise Key Manager and AMD SME help to maintain encryption across the enterprise.

Innovate wherever you imagine

Next-generation PowerEdge servers with AMD processors power the modern data center, so you can drive innovation forward.

Accelerate AI innovations

Enhance business agility and time to market with solutions that support today's transformational workloads.

Innovative systems management

Tame the complexity of your infrastructure with the OpenManage systems management portfolio of tools.

Security from concept to retirement

Accelerate your move to a zero-trust strategy with built-in security features that enable secure interactions and predict potential threats.

Advancing sustainability

Achieve your sustainability goals with energy-efficient solutions that reduce costs and your carbon footprint.

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