THE AMD GUIDE TO *BATTLING SOFTWARE COSTS*

Save up to **61%** on exploding licensing fees[1]

INTRODUCTION

THE SOFTWARE SQUEEZE

CUSTOMERS OF ALL SIZES ARE STRUGGLING

New software licensing regimes are causing massive cost increases. Customers say their software bills have gone up 3x–4x, and tenfold increases have been reported.

Business leaders are feeling trapped between two bad choices: Pay the increased software costs or manage a complex, time-consuming migration.

There is a loophole, one that can cut software license costs and deliver business-wide benefits: modern servers with high-performance AMD EPYC™ CPUs.

300%–1,000%

RECENT SOFTWARE LICENSING INCREASES

SECTION 01

THE LICENSING LOOPHOLE

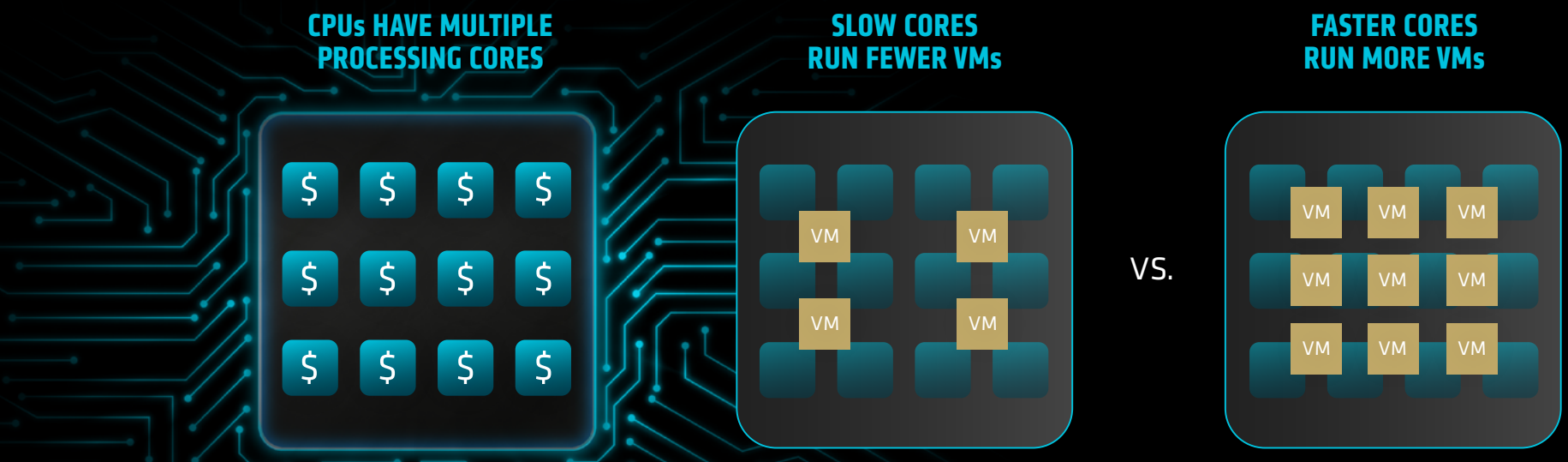
HIGHER-PERFORMANCE CPUs CAN SAVE ON VIRTUALIZATION LICENSE COSTS

The rise in virtualization software license costs stems from a shift in how vendors bill for service from charging per socket to charging per CPU core. The change has hit older data centers particularly hard because legacy CPUs need many cores to support their virtual machine workloads.

There is a way to turn this type of demand-based metering to your advantage and use it to lower your software costs. How? With higher-performance CPUs. Faster CPUs can run more virtual machines (VMs) per core, which means you pay less in core-based license fees.

THE CPU PERFORMANCE LOOPHOLE

Same performance. Fewer cores. Lower costs.



Per-core licenses charge for every core the software uses

Slow CPUs need multiple cores to run one VM, increasing software costs

Newer, faster CPUs run multiple VMs per core, **reducing software costs**

Graphic for illustration purposes only. Actual virtualization performance varies across workloads and CPU specifications.

CPU-BASED SOFTWARE SAVINGS GROW WITH DEMAND

By altering the per-core licensing formula in the customer's favor, faster CPUs create a savings engine that scales as the number of users and virtual machines grow.

The larger the organization, the more it can potentially save on software.

SAVE WITH ANY SOFTWARE THAT USES CORE-BASED LICENSING

- Nutanix™ Cloud Infrastructure
- VMware® Cloud Foundation
- Oracle Database Enterprise
- Windows Server®
- Red Hat® Enterprise Linux®

Actual licensing savings vary across software types, vendors, and licensing structures.

FASTER CORES DELIVER SAVINGS AT SCALE

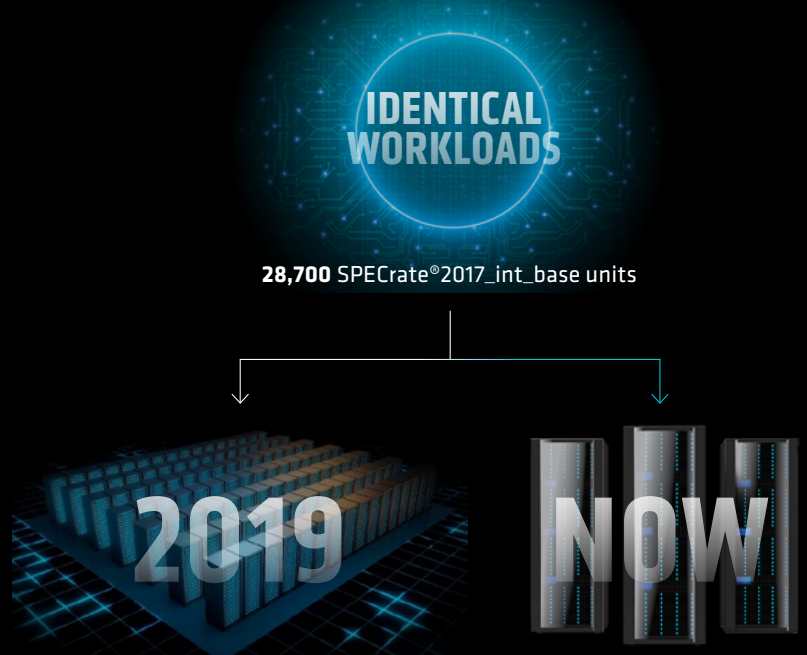


Illustration compares number of dual-socket servers required to a deliver 28,700 SPECrate®2017_int_base score using 2nd Gen (Cascade Lake) Intel Xeon 6252 CPUs and 5th Generation (Turin) AMD EPYC™ 9375F CPUs. See endnote 1 for details.

SECTION 02

THE INFRASTRUCTURE CHOICE

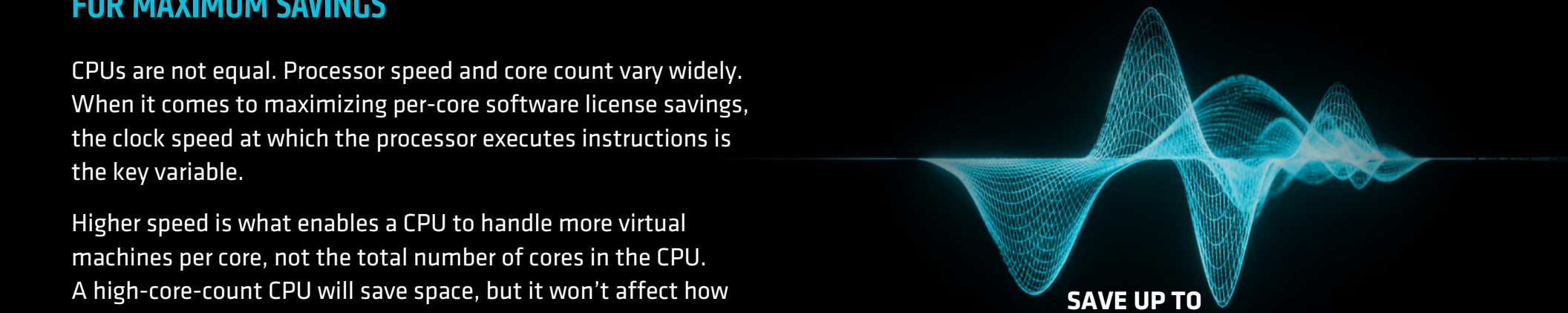
CHOOSE YOUR CPUs CAREFULLY FOR MAXIMUM SAVINGS

CPUs are not equal. Processor speed and core count vary widely. When it comes to maximizing per-core software license savings, the clock speed at which the processor executes instructions is the key variable.

Higher speed is what enables a CPU to handle more virtual machines per core, not the total number of cores in the CPU. A high-core-count CPU will save space, but it won't affect how much you pay for core-licensed software unless it is also a high-performance processor.

AMD EPYC high-performance processors are engineered to maximize software savings.

HIGH-PERFORMANCE
AMD EPYC 9375F CPUs

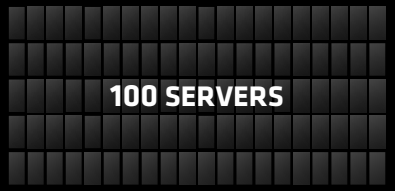


SAVE UP TO
$5.15 MILLION
IN SOFTWARE LICENSING FEES OVER FIVE YEARS[1]

Callout compares number of dual-socket servers required to a deliver 28,700 SPECrate®2017_int_base score using 2nd Gen (Cascade Lake) Intel Xeon 6252 CPUs, 5th Gen (Emerald Rapids) Intel Xeon Platinum 8592+ CPUs, and 5th Generation (Turin) AMD EPYC™ 9375F CPUs. See endnote 1 for details.

THREE PATHS TO THE SAME PERFORMANCE LEVEL

Only one data center will save millions in software fees over five years[1]

1	2	3
Legacy x86 servers	**Current Intel servers**	**High-performance AMD servers**
2.1 GHz	2.8 GHz	3.8 GHz
 100 SERVERS	 40 SERVERS	 29 SERVERS
Core count and software licenses		
4,800	2,560	1,856
Five-year software cost		
$8.4 MILLION	$4.45 MILLION	$3.25 MILLION
		UP TO $5.15 MILLION IN SAVINGS[1]

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GET A NEW DATA CENTER, BREAK EVEN IN SIX MONTHS

IT architectures that depend heavily on virtual machines can offset the cost of a new, high-performance data center with software license savings alone.

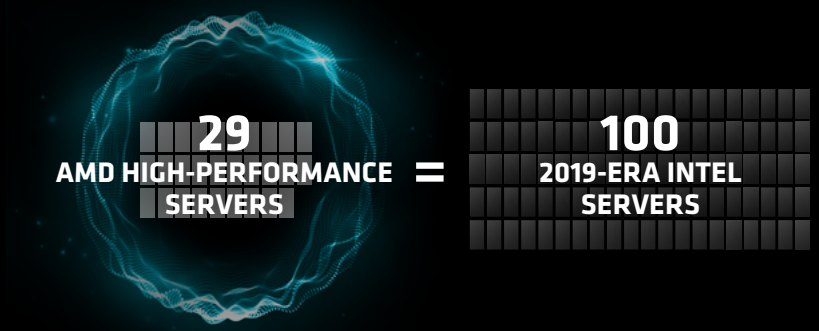
Payback time varies based on the age of your existing servers, but customers with five- to seven-year-old servers could expect an AMD EPYC 9375F CPU-powered data center to break even in as few as six months.[1]

After break-even, the lower operating expenses can free resources for additional servers, AI hardware, or additional IT expertise.

ADDITIONAL POTENTIAL BENEFITS OF MODERNIZING A DATA CENTER

- Latest security features for today's threats
- Modern operating systems and the latest software
- Smaller footprint: less space to rent, buy, and maintain
- Room for AI and increased capacity
- Lower power consumption for lifetime savings

USE UP TO 71% FEWER SERVERS WITH AMD[7]



GET UP TO **61%**
SAVINGS ON PER-CORE SOFTWARE LICENSING[1]

UP TO **50%**
POWER SAVINGS[1]

AVERAGE TIME TO BREAK EVEN:
6.4 MONTHS[1]

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SECTION 03

THE AMD EPYC ADVANTAGE

FASTER DATA CENTER CPUs BOOST SAVINGS AND PERFORMANCE

High-performance AMD EPYC CPUs do more than lower per-core licensing costs. Their leadership instructions per cycle can improve database performance and accelerate time-critical applications like real-time analytics, financial platforms, and media encoding.

The high per-core performance that makes these CPUs ideal for real-time workloads, virtual machines, and cloud-native orchestration can also boost AI performance on GPUs and GPU platforms.

HIGH-PERFORMANCE CPUs ARE JUST ONE MEMBER OF THE AMD EPYC CPU FAMILY

5th Generation AMD EPYC CPUs come in a range of speeds and core counts for optimal performance across the data center and high-performance computing spectrum.

- Multiple models with up to 64 energy-efficient cores
- High-throughput models with up to 192 cores
- Up to 20% higher AI throughput from 8x GPU platforms[2]
- Up to 512 MB cache
- 12 DDR5 memory channels
- Support for up to 6 TB of memory
- Up to 160 PCIe® Gen5 lanes (dual socket)
- Up to 5 GHz

EMIRATES NBD CUTS SOFTWARE COSTS, IMPROVES SERVICE WITH AMD EPYC CPUs

Emirates NBD transformed its banking services using cloud-native, container-based software deployed on servers powered by high-performance AMD EPYC CPUs. By modernizing its infrastructure, Emirates NBD created a flexible technology stack that can scale while reducing costs and improving performance.[3]

42% FASTER PROCESSING

20% LOWER LICENSING COSTS

96% VIRTUALIZATION

2,000 API CALLS PER SECOND, 30M PER DAY

"The AMD EPYC processor is a great product. We haven't had any issues migrating over. We can now run more VMs with the same number of licenses. We get a lot more processing done for the same infrastructure density with fewer servers."

–ALI REY, SENIOR VICE PRESIDENT, TECHNOLOGY PLATFORMS
EMIRATES NBD

CONCLUSION

OUTSMART RISING SOFTWARE COSTS

USE AMD EPYC CPUs

When you upgrade to high-performance AMD EPYC CPUs, you gain a powerful weapon in the fight against exploding per-core software licensing fees. Plus, you get a modern, high-performance data center that can transform your business.

THE WORLD TRUSTS AMD EPYC DATA CENTER CPUs

- **#1 CPU** for hyperscale cloud providers
- Deployed on premises throughout the **Fortune 500**
- Powering three of the top five **supercomputers** in the world[4]
- Installed in **business-critical infrastructure** for finance, automotive, aerospace, technology, telecom, healthcare, and the public sector

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1. This scenario contains many assumptions and estimates and, while based on AMD internal research and best approximations, should be considered an example for information purposes only, and not used as a basis for decision making over actual testing. The Server & Greenhouse Gas Emissions TCO (total cost of ownership) Estimator Tool compares the selected AMD EPYC™ and Intel® Xeon® CPU based server solutions required to deliver a Target Performance Metric of 28700 units of integer performance as of April 10, 2025. This estimation reflects a 5 year time frame. Only power costs and software license costs contribute to OPEX. This analysis compares a 2P AMD 32 core EPYC_9375F powered server with a SPECrate2017_int_base score of 1010 (https://spec.org/cpu2017/results/res2024q4/cpu2017-20241105-45389.pdf) compared to a 2P Intel Xeon 32 core Platinum_8562Y+ based server with a SPECrate2017_int_base score of 729 (https://spec.org/cpu2017/results/res2024q2/cpu2017-20240530-43623.pdf) versus legacy 2P Intel Xeon 24 core Gold_6252 based server with a SPECrate2017_int_base score of 287 (https://spec.org/cpu2017/results/res2019q4/cpu2017-20190916-18249.pdf). For additional details, see https://www.amd.com/en/legal/claims/epyc.html#q=9xx5TCO-011. (9xx5TCO-011)

2. Llama3.1-70B inference throughput results based on AMD internal testing as of 09/01/2024. Llama3.1-70B configurations: TensorRT-LLM 0.9.0, nvidia/cuda 12.5.0-devel-ubuntu22.04, FP8, Input/ Output token configurations (use cases): [BS=1024 I/O=128/128, BS=1024 I/O=128/2048, BS=96 I/O=2048/128, BS=64 I/O=2048/2048]. Results in tokens/second. 2P AMD EPYC 9575F (128 Total Cores) with 8x NVIDIA H100 80GB HBM3, 1.5TB 24x64GB DDR5-6000, 1.0 Gbps 3TB Micron_9300_MTFDHAL3T8TDP NVMe®, BIOS T20240805173113 (Determinism=Power,SR-IOV=On), Ubuntu 22.04.3 LTS, kernel=5.15.0-117-generic (mitigations=off, cpupower frequency-set -g performance, cpupower idle-set -d 2, echo 3> /proc/syss/vm/drop_caches), 2P Intel Xeon Platinum 8592+ (128 Total Cores) with 8x NVIDIA H100 80GB HBM3, 1TB 16x64GB DDR5-5600, 3.2TB Dell Ent NVMe® PM1735a MU, Ubuntu 22.04.3 LTS, kernel-5.15.0-118-generic, (processor.max_cstate=1, intel_idle.max_cstate=0 mitigations=off, cpupower frequency-set -g performance), BIOS 2.1, (Maximum performance, SR-IOV=On), I/O Tokens Batch Size EMR Turin Relative Difference 128/128 1024 814.678 1101.966 1.353 287.288 128/2048 1024 2120.664 2331.776 1.1 211.112 2048/128 96 114.954 146.187 1.272 31.233 2048/2048 64 333.325 354.208 1.063 20.833 For average throughput increase of 1.197x. When scaling to a 1000 node cluster (1 node = 2 CPUs and 8 GPUs) comparing the AMD EPYC 9575F system and Intel Xeon 8592+ system: 128/128 achieves 287,288 more tokens/s, 128/2048 achieves 211,112 more tokens/s, 2048/128 achieves 31,233 more tokens/s, 2048/2028 achieves 20,833 more tokens/s. Results may vary due to factors including system configurations, software versions and BIOS settings. (9xx5-014A)

3. All performance and cost savings claims are provided by Emirates National Bank of Dubai and have not been independently verified by AMD. Performance and cost benefits are impacted by a variety of variables. Results herein are specific to Emirates National Bank of Dubai and may not be typical. (GD-181)

4. TOP500 supercomputer list, November 2024.