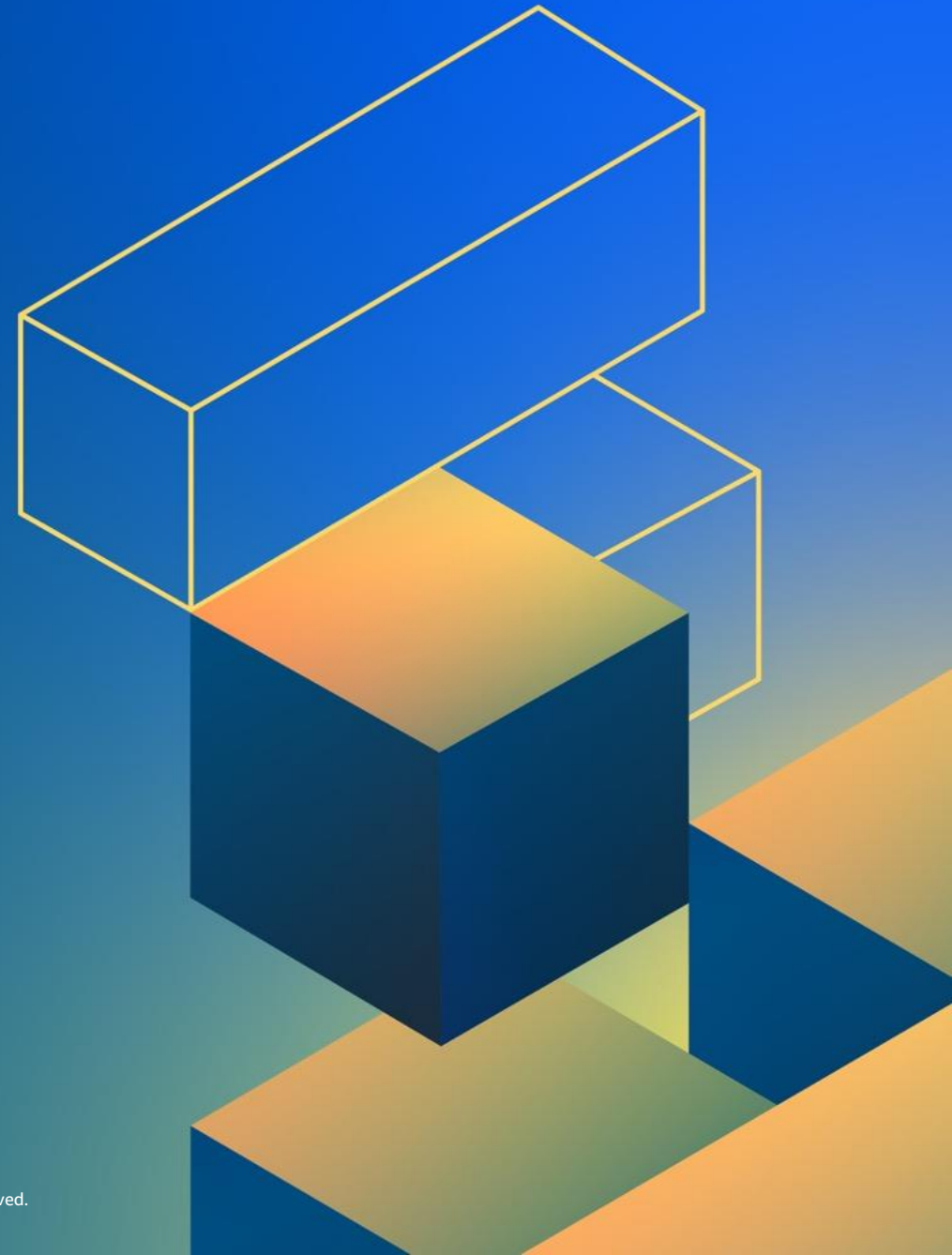# AWS Builders Online Series

How AMD's leadership in cloud computing performance, energy and cost efficiency can help you optimize your cloud spend and save costs

Paul Skaria

Regional Solutions Lead - APJ

AMD

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Why AMD

- Processor choice Matters
- Architecture & Execution matters

Leadership performance

World-class efficiency

Advanced security features

Why AMD
Performance Matters

Cloud Performance Leadership*

	2P Integer Throughput
4th Gen EPYC™ **9654**	**1790** — 3x
3rd Gen EPYC™ **7763**	**861** — 1.4x
Competition	**602**

2P Integer Throughput
SPECrate®2017_int_base

300+ AMD EPYC™ world records and counting on prem and in the cloud**

Infrastructure
- 23 Cloud and virtualization
- 15 Integer performance
- 11 Cloud/VM/integer efficiency

Business applications
- 8 ERP business apps
- 48 Java®-based performance
- 18 Energy efficiency

Engineering/technical
- 72 High performance computing apps
- 58 Floating point performance
- 12 Floating point energy efficiency
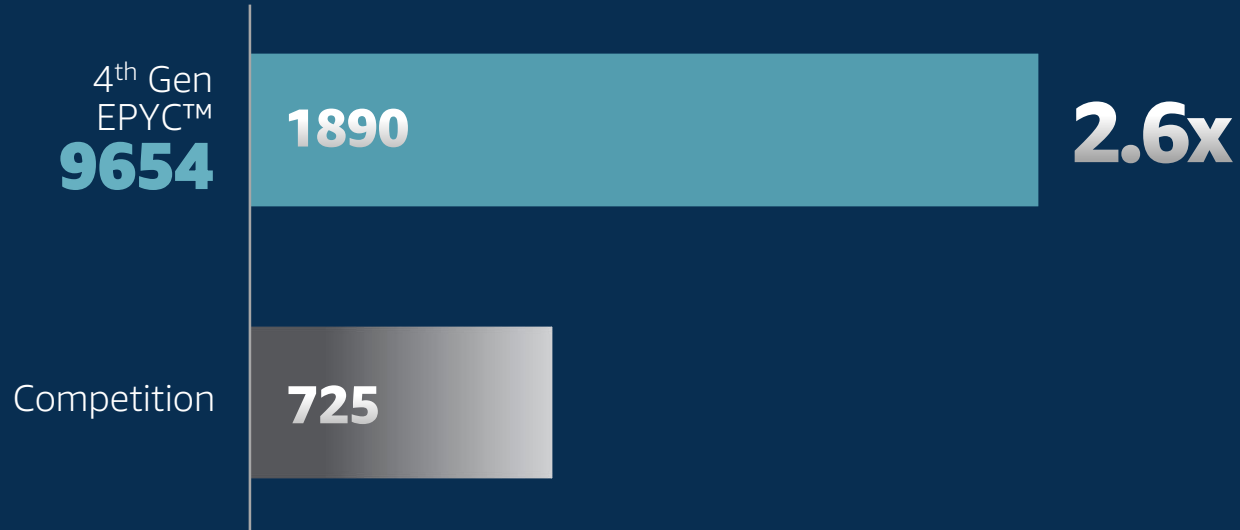
Data management
- 22 Structured data and analytics
- 28 Unstructured data and analytics

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See endnotes *SP5-010B, **SP5-010B

Why AMD
Cloud Efficiency Matters

AMD EPYC processors are the most energy efficient x86 CPU delivering exceptional performance and reduction in energy costs*.

4th Gen EPYC™ 9654

| 1890 | **2.6x** |

Competition

725

2P Integer Energy Efficiency, Performance-per-watt Score
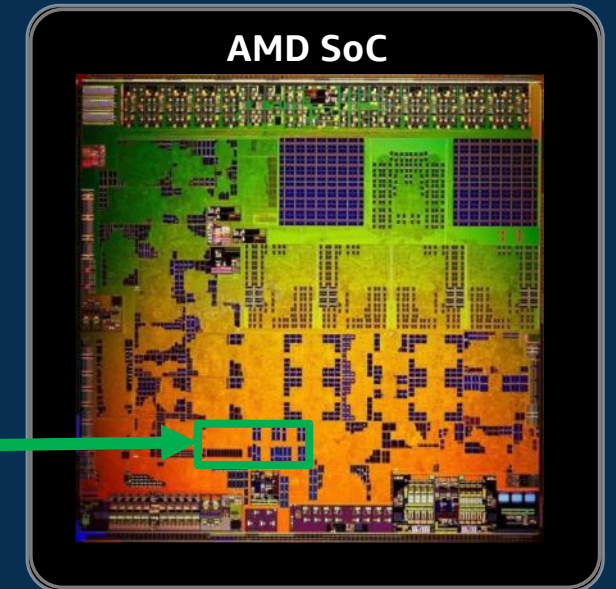SPECrate®2017_int_energy_base**

*EPYC-028

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CPU Choice Matters

CONFIDENTIAL COMPUTING

Shrink the privacy gap with EPYC's confidential computing

✔ **Encrypt data in use.** Encrypt data while it's being processed; help isolate it from unauthorized users, the hypervisor, and even admins. (SEV-SNP)

✔ **Migrate easily.** Efficiently move current x86 instances to AMD EPYC-powered instances; no application changes required.

✔ **Don't compromise performance.** Enjoy advanced security features with minimal impact to performance.
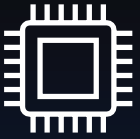
AMD SoC

Root of Trust

AMD Secure Processor

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AWS and AMD

aws partner network | isv accelerate

HPC Competency
65% better price performance

Spend optimization
10–45% EC2 savings with AMD-based instances

MDF and POC funding
Complement and enhance AWS programs

aws

AMD
together we advance_

14 **unique EC2 instance types**
23 **AWS Regions**
70 **Availability Zones**

17 **AWS services using AMD EC2 instance**
Amazon EMR, Amazon Elastic Container Service (ECS), Amazon Elastic Kubernetes Service (EKS), and Amazon GameLift each have customer options for AMD instances

Executive networking events
PGA sponsorship with Deloitte, CMAs, Masters, etc.

AWS and AMD partnership

AWS to offer fourth-generation AMD based Amazon EC2 instances

Global footprint expansion: EC2 M6a and C6a instances expanded to additional cities in US West Asia Pacific, Europe, S. America

Improved EMR Spark cost performance by 15-50% with support for Amazon EC2 M6A and R6A instances

TigerGraph together with AWS and AMD set a **world records for graph database performance at scale with JPMorgan Chase**

▶ LINK

▶ LINK

▶ LINK

▶ LINK

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AWS and AMD collaboration

Performance

Faster application performance with world's highest performance server processor[1], AMD EPYC

Cost efficiency

Deliver up to 10–45% lower cost[2] at same or better performance versus comparable instances

Sustainability

29% less power consumption and 29% lower greenhouse gas emissions[3] versus non-AMD CPUs

Ease of migration

Application and instance size compatibility – makes it easier to migrate at reduced risk

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Optimizing cloud spend

Consider EC2 instances with AMD EPYC when…

- Looking to reduce your costs while maintaining application performance (optimize price/performance)
- You are right-sizing an underutilized EC2 instance
- Flexibility and ease of migration are important

🔄	**Instance type**	Each instance type is optimized for given workload types and prices vary as much as 29% (M, R, C, T).
🔧	**Instance size**	Right-sizing is critical to keeping costs under control. AMD's latest general compute instances come in 10 different sizes.
📍	**Region/location**	Regional pricing varies by as much as 10–18% and up to 45% in Mumbai.
📋	**Plan type**	Reserved Instances, EC2 and compute Savings Plans, On-Demand, and Spot Instances. AMD instances are available in every plan; savings of 24–70%.

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Optimizing cloud spend

STRATEGIC TOOL VENDOR PARTNERS

Make room in your cloud budget for new workloads and capacity expansion
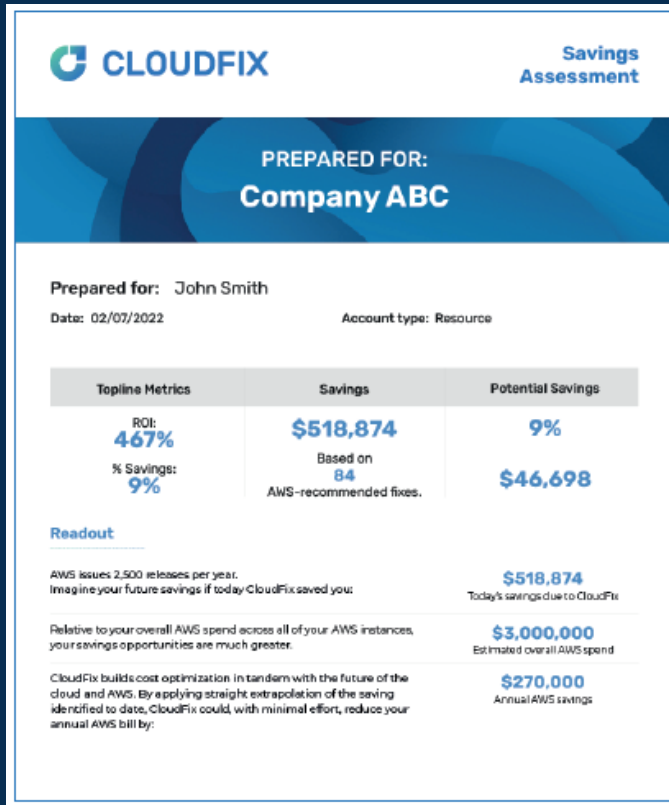
Data is essential to managing cloud spend

FinOps teams play an important role in helping evaluate and automate those decisions

Optimizing cloud spend

EVALUATE CLOUD SPEND WITH FINOPS PARTNER CLOUDFIX

Customers can save 15–60% per AWS service*

- AWS specific cost optimizations
- High reliability, nondisruptive, low-to-no downtime fixes
- Easy implementation of fixes – deploy automatically or manually with one click

Fast installation, continuous scanning → automatic/manual deployment of easy fixes

- Fast, 5-minute installation
- Scans and analyzes your AWS environment to find quick cost optimizations
- Uses small, safe optimizations that help you find ways to improve cost efficiency and performance
- Finds and implements AWS advisories announced each week
- Available on AWS Marketplace

Start saving today

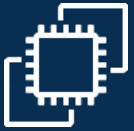- Contact Aurea CloudFix to schedule a spend optimization assessment

*CloudFix, "AWS Cost Optimization You Can Trust" – https://cloudfix.aurea.com/aws/

AWS and AMD portfolio

SCALABLE PERFORMANCE FOR A BROAD VARIETY OF WORKLOADS IN AMAZON EC2

Right-size your workloads

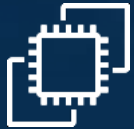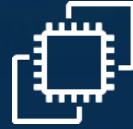## AMD-BASED INSTANCES
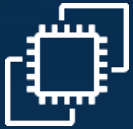
M6A|M5A	R6A|R5A	C6A|C5A	T3A	G4AD	HPC6A	G5	F1 and VT1
GENERAL PURPOSE	MEMORY OPTIMIZED	COMPUTE OPTIMIZED	BURST OPTIMIZED	GPU OPTIMIZED	HPC OPTIMIZED	GPU OPTIMIZED*	FPGA ACCELERATOR*

*Check with your AWS sales contact to confirm what cost savings may be available

AWS and AMD Portfolio

Storage	Analytics	Media services	Compute	Containers	Gaming	Database	End user computing
AWS Snowball	Amazon EMR	Twitch	AWS Batch	Amazon EKS	Amazon GameLift	Amazon RDS	Amazon AppStream
		Amazon Nimble Studio	AWS ParallelCluster	Amazon ECS	Amazon Luna		Amazon WorkSpaces
		AWS Elemental					

aws

Summary
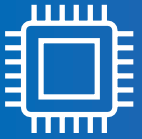
CPU Choice Matters

- Cloud Performance Leadership
- Cloud Efficiency Leadership
- Confidential Computing Leadership

Optimize Cloud Spend

- Free up budget for new applications and capacity expansion
- Reach out to our FinOps partners: Aurea CloudFix, Cloudsaver, Yellowdog

Thank you for attending AWS Builders Online Series

We hope you found it interesting! A kind reminder to **complete the survey.**
Let us know what you thought of today's event and how we can improve the event experience for you in the future.

aws-apj-marketing@amazon.com

twitter.com/AWSCloud

facebook.com/AmazonWebServices

youtube.com/user/AmazonWebServices

linkedin.com/company/amazon-web-services

twitch.tv/aws

Thank you!

aws@amd.com

Endnotes

EN-1
AMD CPU pricing Jan 2022. Intel Xeon Scalable CPU pricing from https://ark.intel.com, as of Jan 2022. All pricing is in USD. Analysis based on AMD EPYC Bare Metal Server and Greenhouse Gas TCO Tool, v4.2. Comparisons made using SPECrate 2017_int_base on 01/14/2022. SPEC, SPECrate and SPEC CPU are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org for more information. Includes hardware acquisition cost and 3-year opex

SP5-013B
SPECrate®2017_int_base comparison based on published scores from www.spec.org as of 01/11/2023. The AMD EPYC scored 1790 SPECrate®2017_int_base is higher than all other 2P scores published on the SPEC® website. Comparison of published 2P AMD EPYC 9654 (1790 SPECrate®2017_int_base, 800 Total TDP W, 192 Total Cores, $23610 Total CPU $, http://spec.org/cpu2017/results/res2022q4/cpu2017-20221024-32607.html) is 1.81x the performance of published 2P Intel Xeon Platinum 8490H (991 SPECrate®2017_int_base, 700 Total TDP W, 120 Total Cores, $34000 Total CPU $, http://spec.org/cpu2017/results/res2023q1/cpu2017-20221206-33039.html) [at 1.58x the performance/W] [at 2.60x the performance/CPU$]. Published 2P AMD EPYC 7763 (861 SPECrate®2017_int_base, 560 Total TDP W, 128 Total Cores, $15780 Total CPU $, http://spec.org/cpu2017/results/res2021q4/cpu2017-20211121-30148.html) at 0.87x the performance, 1.09x the performance/W and 1.87x the performance/CPU$ for reference. AMD 1Ku pricing and Intel ARK.intel.com specifications and pricing as of 1/10/23. SPEC®, SPEC CPU®, and SPECrate® are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org for more information.

SP5-065A
SPECrate®2017_int_energy_base comparison based on published results as of 1/10/2023. Configurations: 2P AMD EPYC 9654 (1890 SPECrate®2017_int_energy_base/1190 SPECrate®2017_int_base, 192 total cores, www.spec.org/cpu2017/results/res2022q4/cpu2017-20221024-32633.html) vs. 2P Intel Xeon Platinum 8490H (1100 SPECrate®2017_int_energy_base/689 SPECrate®2017_int_base, 120 total cores, https://spec.org/cpu2017/results/res2023q1/cpu2017-20221205-33017.html). 2P AMD EPYC 7713 (1610 SPECrate®2017_int_energy_base/576 SPECrate®2017_int_base, 128 total cores, www.spec.org/cpu2017/results/res2021q1/cpu2017-20210301-25148.html) shown at 1.46x for reference. SPEC® and SPECrate® are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org for more information. NOTE: Red text only needs to be included with charts that show the 7763.

SP5TCO-023A:
As of 11/15/2022 based on AMD Internal analysis using the AMD EPYC™ Bare Metal Server & Greenhouse Gas Emission TCO Estimation Tool - version 6.35 estimating the cost and quantity of 2P AMD EPYC™ 9654 powered servers versus 2P Intel® Xeon® 8380 based server solutions required to deliver 8500 units of integer performance. It uses August 2022 cost of power in Germany.
Environmental impact estimates made leveraging this data, using the Country / Region specific electricity factors from the '2020 Grid Electricity Emissions Factors v1.4 – September 2020', and the United States Environmental Protection Agency 'Greenhouse Gas Equivalencies Calculator'.
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 analysis includes both hardware and virtualization software components.
For additional details, see https://www.amd.com/en/claims/epyc4#faq-SP5TCO-023A.

*SP5-010B: SPECrate®2017_int_base based on published scores from www.spec.org as of 11/10/2022. Configurations: 2P AMD EPYC 9654 (1790 SPECrate®2017_int_base, 192 total cores, www.spec.org/cpu2017/results/res2022q4/cpu2017-20221024-32607.html) is 2.97x the performance of published 2P Intel Xeon Platinum 8380 (602 SPECrate®2017_int_base, 80 total cores, http://spec.org/cpu2017/results/res2021q2/cpu2017-20210521-26364.html). Published 2P AMD EPYC 7763 (861 SPECrate®2017_int_base, 128 total cores, http://spec.org/cpu2017/results/res2021q4/cpu2017-20211121-30148.html) is shown at 1.43x for reference. SPEC®, SPEC CPU®, and SPECrate® are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org for more information.
**Endnote: SP5-010B **World records reflect EPYC family records as of November 10, 2022. See amd.com/worldrecords

EEPYC-028: As of 2/2/22, of SPECpower_ssj® 2008 results published on SPEC's website, the 55 publications with the highest overall efficiency results were all powered by AMD EPYC processors. More information about SPEC® is available at http://www.spec.org. SPEC and SPECpower are registered trademarks of the Standard Performance Evaluation Corporation.
**Endnote: SP5-065

Slide 9 - 1 AMD EPYC 7763; Results as of 01/28/2021 using SPECrate 2017_int_base – https://spec.org/cpu2017/results/res2020q2/cpu2017-20200525-22554.pdf
Slide 9 - 2 https://aws.amazon.com/ec2/amd/
Slide 9 - 3: See Endnote EN-1. Analysis based on AMD EPYC Bare Metal Server and Greenhouse Gas TCO Tool, v4.2, https://www.amd.com/en/processors/epyc-bare-metal-tco-tool