

## AMD 4Q 2024 EARNINGS: DATA CENTER GROUP

STEVE MCDOWELL, CHIEF ANALYST  
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### CONTEXT

Advanced Micro Devices (AMD) reported a stellar end to 2023, marking achievements within its Data Center business amidst a fluctuating demand landscape.

The company's fourth-quarter earnings were buoyed by a 10% year-over-year revenue increase, hitting \$6.2 billion, with strong growth seen by its data center segment.

### Q4 2023 SUMMARY P&L | GAAP

(\$ in millions, except per share data)	Q4'23	Q4'22	Y/Y	Q3'23	Q/Q
Revenue	\$6,168	\$5,599	Up 10%	\$5,800	Up 6%
Gross Profit	\$2,911	\$2,403	Up 21%	\$2,747	Up 6%
Gross Margin	47%	43%	Up 4 pts	47%	Flat
Operating Expenses	\$2,575	\$2,557	Flat	\$2,533	Up 2%
Operating Expense/Revenue %	42%	46%	Down 4 pts	44%	Down 2 pts
Operating Income (Loss)	\$342	\$(149)	Up 330%	\$224	Up 53%
Operating Margin	6%	(3)%	Up 9 pts	4%	Up 2 pts
Net Income	\$667	\$21	Up 3,076%	\$299	Up 123%
Earnings Per Share <sup>1</sup>	\$0.41	\$0.01	Up 4,000%	\$0.18	Up 128%

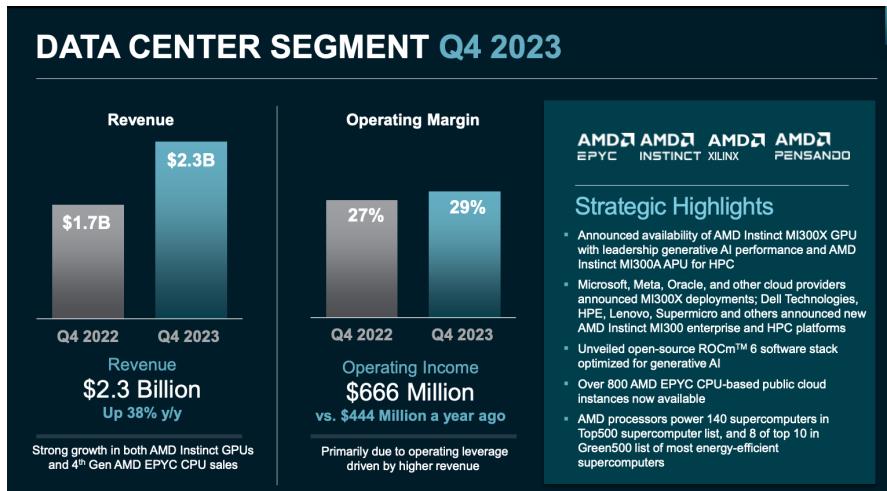
The period saw record-breaking annual revenue for the data center sector, underscored by the successful ramp-up of Instinct AI accelerators and a steadfast demand for EPYC server CPUs.

This Research Note will focus primarily on AMD's Data Center Group and those elements that impact enterprise infrastructure.

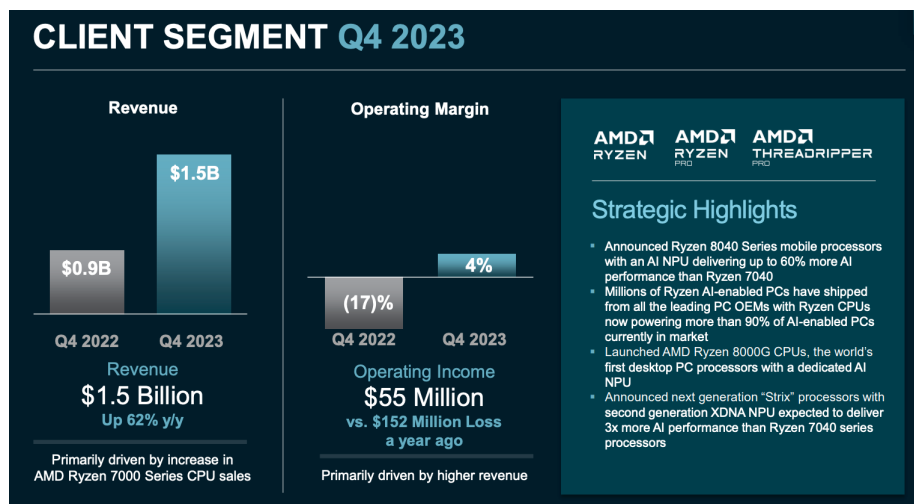
## OVERALL PERFORMANCE

Here's a summary of AMD's overall performance during the quarter:

- **Revenue Growth:** AMD's fourth-quarter revenue increased by 10% year-over-year to \$6.2 billion.
- **Data Center Strength:** Significant growth in the data center segment with a 38% year-over-year increase, amounting to a record \$2.3 billion, driven by solid sales of Instinct AI accelerators and EPYC server CPUs.



- **Client Segment Increase:** Client segment revenue increased 62% year over year, attributed to strong sales of Ryzen 7000 Series CPUs.



- **Annual Revenue:** Despite a 4% decline in annual revenue totaling \$22.7 billion, record data center and embedded segment revenues were noted.
- **Embedded and Gaming Declines:** There was a decrease in revenue for the embedded (24% year-over-year) and gaming segments (17% year-over-year).

- **Operating Income:** The data center segment's operating income rose to \$666 million, while the the client segment turned around from a loss to a profit of \$ 55 million.
- **Cash Flow and Inventory:** Generated \$381 million in cash from operations, decreasing inventory to \$4.4 billion.
- **Share Repurchases:** AMD repurchased 2 million shares and returned \$233 million to shareholders in the quarter.

## QUARTER HIGHLIGHTS

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In its earnings call, CEO Lisa Su pointed out several highlights achieved by AMD during the quarter:

- **Data Center Sales Acceleration:** AMD experienced a significant acceleration in data center sales throughout the year, culminating in a strong finish for 2023.
- **Record Revenue:** The data center segment achieved record annual revenue, with robust growth in the fourth quarter, propelled by the ramp-up of Instinct AI accelerators and solid demand for EPYC server CPUs.
- **Revenue Growth:** Fourth-quarter revenue increased 10% year-over-year, reaching \$6.2 billion, mainly due to data center and client segment growth.
- **Market Share Gains:** AMD gained server share, launched next-generation Instinct AI accelerators, and maintained a leading position in adaptive computing solutions.
- **Server CPU and GPU Records:** Both server CPU and Data Center GPU sales achieved quarterly and annual revenue records, with products accelerating throughout the year.
- **Cloud and Enterprise Growth:** AMD secured growth in cloud and enterprise sales, with notable deployments by major North American hyperscalers and significant customer wins in various industry sectors.
- **Product Launches:** New Ryzen 8000 Series processors were launched, including mobile and desktop processors with enhanced AI performance.
- **Embedded and Gaming Segment Performance:** The embedded segment saw a revenue decrease, while the gaming segment experienced growth in Radeon GPU sales despite declining semi-custom revenue.
- **Cash Flow and Shareholder Returns:** AMD generated substantial cash from operations and continued its share repurchase program, returning significant value to shareholders.

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## QUARTER CHALLENGES

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Su also highlighted some headwinds that continue to face AMD:

- **Mixed Demand Environment:** AMD acknowledges the presence of a mixed demand environment that could impact their sales and revenue streams.
- **Inventory Management:** Managing inventory levels is an ongoing challenge, particularly in the Embedded segment, where customers are working to normalize excess inventory.
- **Market Saturation:** The Gaming segment is entering the fifth year of the console cycle, which may result in a plateau or decline in demand as the market becomes saturated.
- **Supply and Demand Balance:** The high demand for AMD's products, particularly GPUs for AI applications, requires careful management of supply chains to meet customer needs without overproducing.
- **Competition:** Intense competition in the semiconductor industry, especially from rivals Intel and NVIDIA, threatens maintaining market share and profit margins.

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## DATA CENTER GROUP PERFORMANCE

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AMD's Data Center business showed robust performance in the quarter, highlighted by:

- **Record Annual Revenue:** AMD's Data Center segment achieved record annual revenue, indicating strong and sustained growth in this sector.
- **Accelerated Sales:** Data center sales significantly accelerated throughout the year, even amid a mixed-demand environment.
- **Growth in Data Center and Client Segments:** Revenue increased 10% year over year to \$6.2 billion in the fourth quarter, propelled by double-digit growth in both data center and client segments.
- **Server CPU and GPU Sales:** Both server CPU and data center GPU sales set quarterly and annual records, indicating a substantial demand for AMD's data center products.
- **Market Share Gains:** AMD experienced server CPU revenue share gains in the quarter, driven by growth in sales of their fourth-gen EPYC processors and sustained demand for their third-gen EPYC processor portfolio.

- **Cloud Segment Performance:** Despite soft overall demand, server CPU revenue increased year-over-year and sequentially due to expansion in fourth-gen EPYC processor deployments among North American hyperscalers.
- **Enterprise Segment Growth:** The enterprise segment saw a significant double-digit percentage increase, driven by multiple wins across various sectors, positioning AMD for continued growth.
- **AI Accelerators:** The ramp-up of Instinct AI accelerators contributed significantly to revenue growth, with solid demand across cloud services, enterprises, and AI customers.
- **Upcoming Turin Processors:** The upcoming Turin family of EPYC processors is generating strong customer excitement and, upon its launch later in the year, is expected to further enhance AMD's performance, efficiency, and total cost of ownership (TCO) leadership.
- **Data Center GPU Business:** The data center GPU business witnessed substantial acceleration, with revenue surpassing expectations due to a faster ramp of MI300x with AI customers. This demonstrates AMD's competitiveness in the AI and machine learning market.

This performance underscores AMD's strengthening position in the data center market and its successful capture of growth opportunities within the AI and cloud sectors.

## AMD MI-300 AI ACCELERATOR

AMD's MI300 is a crucial driver of the company's accelerated growth in the data center space.

The slide is divided into several sections showcasing the AMD MI300 ecosystem:

- AMD Instinct™ MI300X In Volume Production:** A teal header for the MI300X series.
- Broad AI Solutions Ecosystem:** A grid of logos for various partners including Microsoft, Meta, Oracle, Dell Technologies, Hewlett Packard Enterprise, Lenovo, Qorvo, ASUS, GIGABYTE, Ingrasys, Inventec, QCT, Wistron, wiyynn, Aligned, ARMON ENERGY, Cirruscale, Crusoe, DENVR, TENSORWAVE, CISCO, BROADCOM, and ARISTA.
- AMD Instinct™ MI300A In Volume Production:** A dark header for the MI300A series.
- Powering LLNL El Capitan:** A section featuring logos for Hewlett Packard Enterprise, EVIDEN, GIGABYTE, and SUPERMICR, with a photo of the El Capitan supercomputer.
- AMD ROCm™ 6 Open Software Ecosystem for AI and HPC:** A section with the AMD ROCm logo.
- AI Software Ecosystem and Innovators:** A section with logos for databricks, DeepLearning.AI, essential AI, IBM, LAMINI, ONNX, PyTorch, and TensorFlow.

Here's what Lisa Su said about the new product during AMD's earnings call:

- **Significant Revenue Contribution:** The MI300 series has been a major factor in AMD's rapid revenue growth in its data center GPU business, surpassing the \$400 million revenue expectation for the quarter.
- **Advanced Features:** The MI300 family boasts AMD's high-performance CDNA 3 architecture, complemented by industry-leading memory bandwidth and capacity. These features contribute to the MI300's standout generative AI performance.
- **Broad Industry Support:** The launch of the MI300 was backed by substantial support from major cloud providers, original equipment manufacturers (OEMs), and numerous leading AI developers, indicating its wide acceptance and potential for integration across various sectors.
- **Positive Customer Response and Production Ramp-Up:** The response to the MI300 series has been overwhelmingly positive, prompting AMD to aggressively increase production to meet the growing demand from cloud, enterprise, and supercomputing customers.
- **Role in Supercomputing:** Notably, the MI300A accelerators were shipped primarily for the El Capitan supercomputer, which is expected to be the world's fastest supercomputer when it becomes operational.
- **Ecosystem Development:** AMD has made strides in expanding the AI developer ecosystem working on its platforms, with the release of the ROCm 6 software suite enhancing performance in key AI workloads and supporting more frameworks and libraries.
- **Increased Customer Engagement:** The rollout of Azure private previews of new MI300 instances aligned with the launch and the product's ability to quickly adapt to advanced large language models like GPT-4 in production environments highlights its versatility and efficiency.

The MI300 is a pivotal product for AMD, driving significant revenue growth and positioning the company as a competitive player in the AI and data center GPU markets.

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## ANALYSIS

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AMD is navigating a dynamic market with agility, particularly in its data center business. AMD's substantial revenue growth in this sector, driven by the acceleration of their Instinct AI accelerators and consistent demand for EPYC server CPUs, underscores a robust product acceptance across cloud, enterprise, and AI applications.

The forthcoming Turin EPYC processors, which promise enhanced performance and efficiency, and well-received MI-300 accelerators are poised to further AMD's market share and sustain its upward trajectory.

However, challenges loom, particularly in supply chain dynamics and competitive pressures. AMD's ability to maintain its innovation pace and manage operational costs will be critical in solidifying its position in the high-stakes server and AI accelerator markets.

The company's current trajectory and product roadmap position it well for continued success, but the shifting sands of technological demand and economic headwinds will require vigilant steering.



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