AMPERE®

Triple data center efficiency with Cloud Native Processors

Cut power consumption without sacrificing performance

Unmatched data center efficiency with Cloud Native Processors

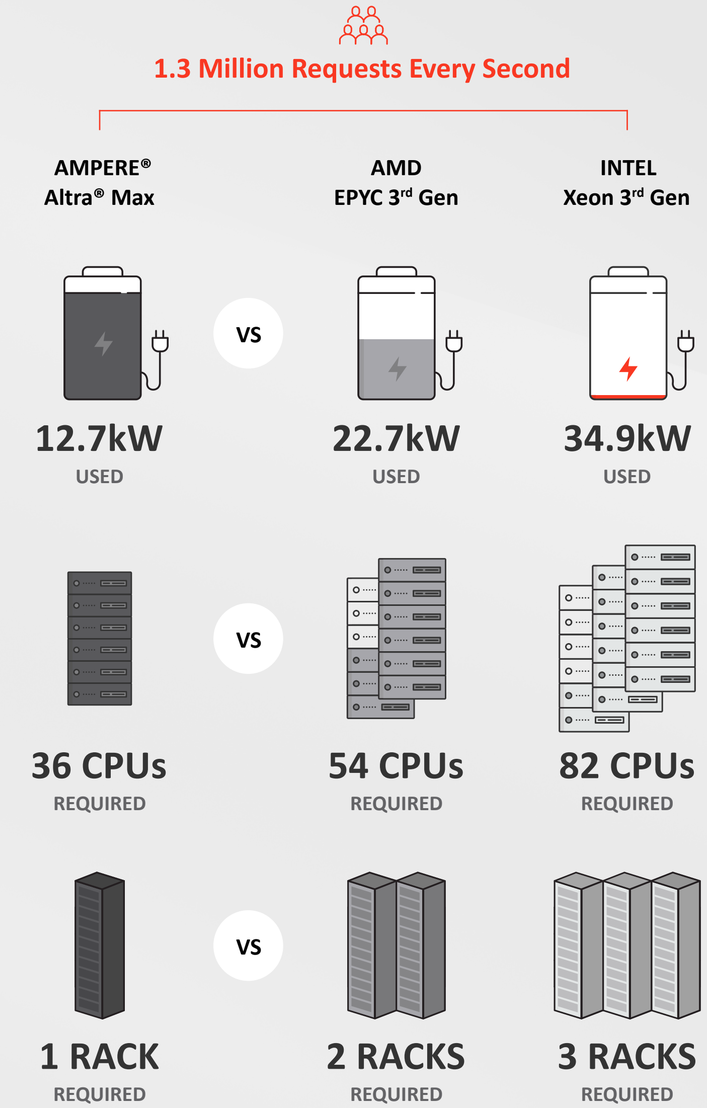
As the load on popular cloud services rapidly increases, responding to millions of internet user requests per second will require infrastructure scale out.

Designed specifically for cloud infrastructure—and not merely adapting a legacy technology—Cloud Native Processors deliver maximum performance consistently across many users at high utilization. Scalable and efficient, Cloud Native Processors reduce data center power consumption and physical space requirements—a foundation for rack level efficiency and the means of a truly sustainable future.

Cloud Native Processors deliver better efficiency at scale than legacy x86 processors, without sacrificing performance.

In this eBook, we detail how you can achieve your data center efficiency and sustainability goals using Ampere® Cloud Native Processors built specifically for the modern era of cloud computing. It's easy to get started. Just ask us.

Footnote: The web services study in this eBook is based on performance and power data for many typical workloads using single node performance comparisons measured and published by Ampere® Computing.
Details available at https://amperecomputing.com/home/efficiency-footnotes



Why Cloud Native Processors from Ampere?

Ampere Computing is a modern semiconductor company designing the future of cloud computing with the world's first Cloud Native Processors. Built for the sustainable Cloud, Ampere products deliver the highest performance per watt and per rack.

By providing a new level of predictable performance and efficiency, Ampere is working with leading hyperscalers and an expansive partner ecosystem to deliver Cloud Native Processors that can handle the compute demands of today and tomorrow.

Ampere offers superior performance on the parameters for what matters to data center operators:

1. Greater CPU Power Efficiency
2. Higher Performance Per Rack
3. Higher Rack Density for a Smaller Data Center Footprint
4. Operational Cost Savings and Sustainability

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Efficiency starts with lower power consumption at the core

01

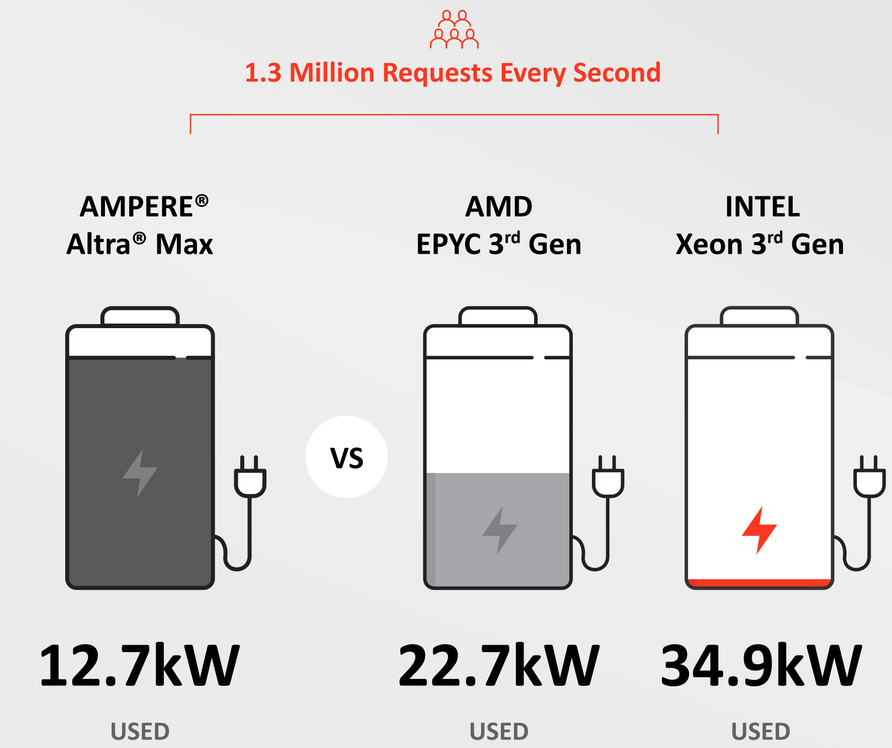
2.8x less power to deliver the same performance

Increasingly limited power availability, rising costs, and skyrocketing demand have created a perfect storm for data center operators.

Simultaneously, innovative cloud infrastructure technology has brought about a change in trajectory for the industry.

Attempts by legacy x86 processors to deliver more performance for the cloud have resulted in merely escalating power consumption.

Architecturally unique Cloud Native Processors deliver the level of power efficiency and performance needed to meet the sheer volume of cloud workload growth.



Ampere Altra Max delivers the same performance at 2.8x less power for web services workloads.

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Growing pressure to reduce power consumption

Environmental, Social, and Governance (ESG) goals and mandates are putting sustainability at the highest level of corporate growth plans. In many geographies, excessive data center power consumption has become a self-limiting phenomenon and has led to moratoriums and delays in public referendums on new data center build out.


Ireland


Amsterdam


Singapore


London


Frankfurt


Virginia & Arizona

Recent Limits & Moratoriums on DC Expansion

Notes:
https://techmonitor.ai/technology/cloud/inside-the-data-centre-moratorium-movement

Ampere lowers power and costs for Plesk/Webpros

“One of the main advantages of using Ampere architecture is cost efficiency, as less power is consumed. Ampere processors are designed to have the lowest possible energy consumption while delivering exceptional processing power.”

Anton Akhtyamov

plesk

Product Manager

High performance scales out to the rack

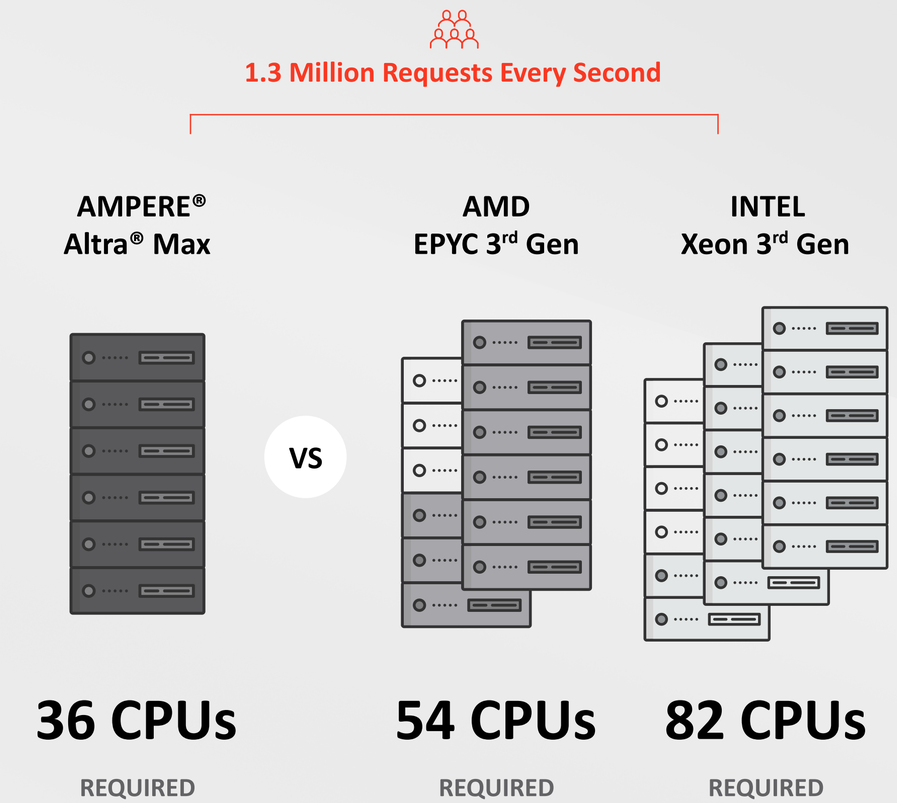
02

2.5x better performance per rack

Producing more compute capacity in every rack is vital to overall data center efficiency and performance. It begins with CPUs that draw less power—allowing each rack to be more densely populated and resulting in less equipment needed for power delivery, cooling, and interconnect.

The inherently low power consumption, higher core count, and consistent performance of Cloud Native Processors decrease the number of racks required for complex micro services—delivering the greatest rack level efficiency in the industry.

Increase your throughput and conserve rack space with the smallest CPU footprint and lowest power consumption possible.



Ampere Altra Max delivers 2.5x more workload performance per rack

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Unprecedented performance per rack across workloads

As organizations expand key workloads in the cloud, data center operators must deliver cost-effective, scalable solutions.

Performance per rack is an ideal way to measure the performance and efficiency for real-life workloads under the typical constraints of power and space.

Cloud Native Processors offer more opportunity for growth by outperforming legacy architecture and delivering up to 2.5x better performance per rack for complex web services.

As workloads scale out, performance and power combine to deliver unprecedented performance per rack for the most demanding workloads, including:

- Web Services
- Databases
- Artificial Intelligence (AI)
- Search
- Data Analytics
- Media Delivery and Gaming

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Ampere® vs Intel Xeon 3rd Gen

Web Tier	App	Ampere® Perf
Front End	NGINX	**3.5x faster**
Caching Tier	Memcached	**2.1x faster**
Key Value Store	Redis	**2.6x faster**
Back End	MYSQL	**1.6x faster**
Complex Web Service Average		**2.5x faster**

Ampere® vs AMD EPYC 3rd Gen

Web Tier	App	Ampere® Perf
Front End	NGINX	**2x faster**
Caching Tier	Memcached	**1.5x faster**
Key Value Store	Redis	**1.6x faster**
Back End	MYSQL	**1.6x faster**
Complex Web Service Average		**1.7x faster**

HPE looks to the next generation of compute with Ampere

“The future of Compute must rise to the relentless pace of data, all while delivering major improvements in energy efficiency. Imagine being able to double or triple the number of workloads, yet keeping within your current physical and power footprint. With the new HPE ProLiant RL300 Gen11 powered by Ampere processors, the next generation of Compute efficiency is here.”

Neil MacDonald

Hewlett Packard Enterprise

Executive Vice President & General Manager, Compute

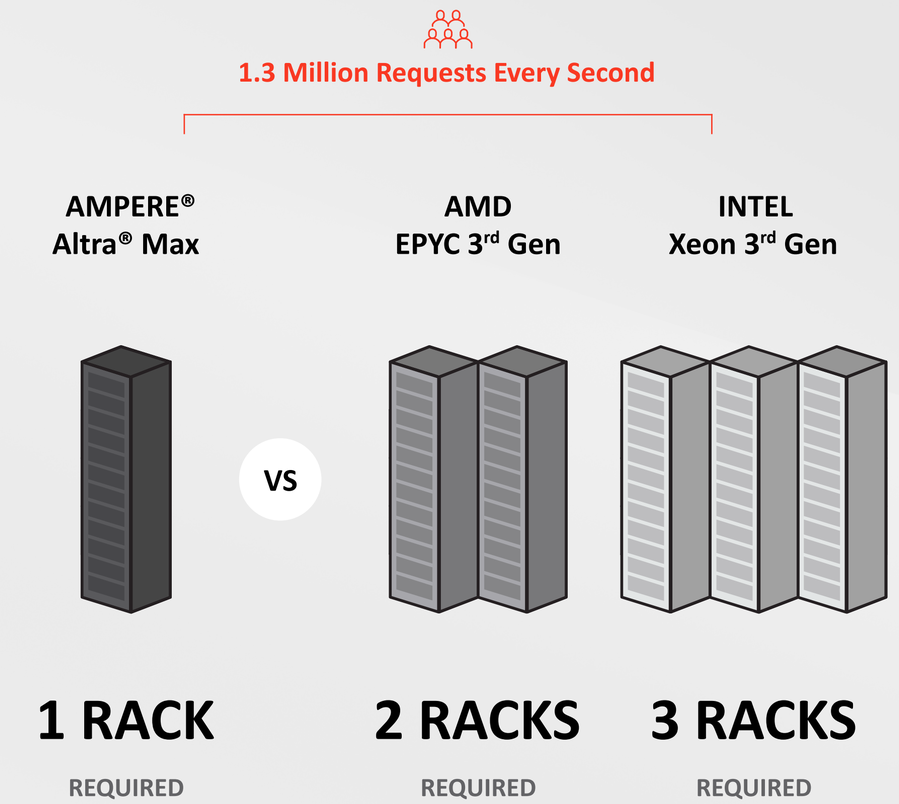
Fewer racks reduce the entire data center footprint

3x smaller data center footprint

Growing compute demands have put pressure on service providers to increase capacity at a time when communities are shining a spotlight on data centers as a source of unsustainable resource consumption—from power to water and land.

Increasing capacity with legacy x86 processors means adding more CPUs and more racks—requiring more data center build out and power consumption.

Data center operators now have the sustainable way forward with Cloud Native Processors. Less racks of servers are needed for the same capacity—reducing the overall resource footprint.



Ampere Altra Max delivers the same compute performance in up to 1/3 the data center footprint

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Avoid the complexities of data center build out

The complexities of data center build out with legacy x86 processors

- Increased carbon footprint
- Increased energy costs
- Limited access to energy and water
- Complicated thermal solutions
- Growing real estate constraints

The cloud native solution

- Higher performance improves compute capacity
- Server power efficiency increases rack density
- Reduction in rack and equipment overhead
- Reduced square footage to house racks
- Less power and water for cooling

Power and space efficiency saves millions

04

Do more in your data center for less

Budgetary cuts, intensified competition, and rising energy and infrastructure costs are putting pressure on your bottom line. Continuing to use legacy x86 processors to meet your customers' growing demands for cloud compute will limit your ability to grow, meet sustainability goals, and control costs.

Alternatively, deploying Cloud Native Processors now will save you millions of dollars over the next five years—cutting the cost of server operation in half every minute your servers are running.

Scaling our web service study to operate at data center scale and serving an even larger workload demand that powers many racks, the total energy savings is substantial. Beat the competition and show greater ROI when you switch to cloud native processors.

In one year, a 100,000 square foot data center servicing 1.8 billion requests per second could realize:

$31.5M

energy savings based on average US electricity costs

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Ampere lowers CO_2 emissions and costs for Matoha

"Switching to Ampere-optimized Tensorflow running on OCI A1 instances has enabled us to achieve a 75 percent cost saving for the training of the algorithms for our plastics and fabrics identification machines, while lowering our CO_2 emissions—thanks to Ampere Altra's high energy efficiency."

Martin Holicky

Matoha

CEO

Data center sustainability is no longer optional

05

Lower your carbon footprint for a greener planet

Runaway power demand and data center sprawl have created an imperative for sustainable data center operations.

Based on the energy consumption of a medium-sized data center delivering a web services workload, Cloud Native Processors can save over 201,000 metric tons of carbon in ONE YEAR—equivalent to:

215,623

acres of forest carbon captured

39,035

cars off the road

35,245

US homes powered

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Meet environmental, social, and governance goals

Climate change, government policies, and ethical imperatives are prompting organizations to drive sustainability through their supply chains and data centers. Environmental, social, and governance (ESG) goals have taken on greater urgency with accelerated global warming and increasingly limited natural resources.

Cloud native computing has the potential to help data centers—and their customers—reach carbon neutral goals by:

1. Reducing power requirements
2. Lowering overall power budgets
3. Scaling out to increase capacity
4. Decreasing cooling costs and water use
5. Serving more users in a smaller footprint
6. Easing data center capacity constraints

Cloudsigma realizes higher power efficiency with Ampere

“Based on our benchmarking, the HPE ProLiant RL300 Gen11 server with Ampere processors is delivering a significantly higher power efficiency. This is allowing us to both meet our improved sustainability goals and provide a lower cost of delivery to our end customers.”

Robert Jenkin

CloudSigma

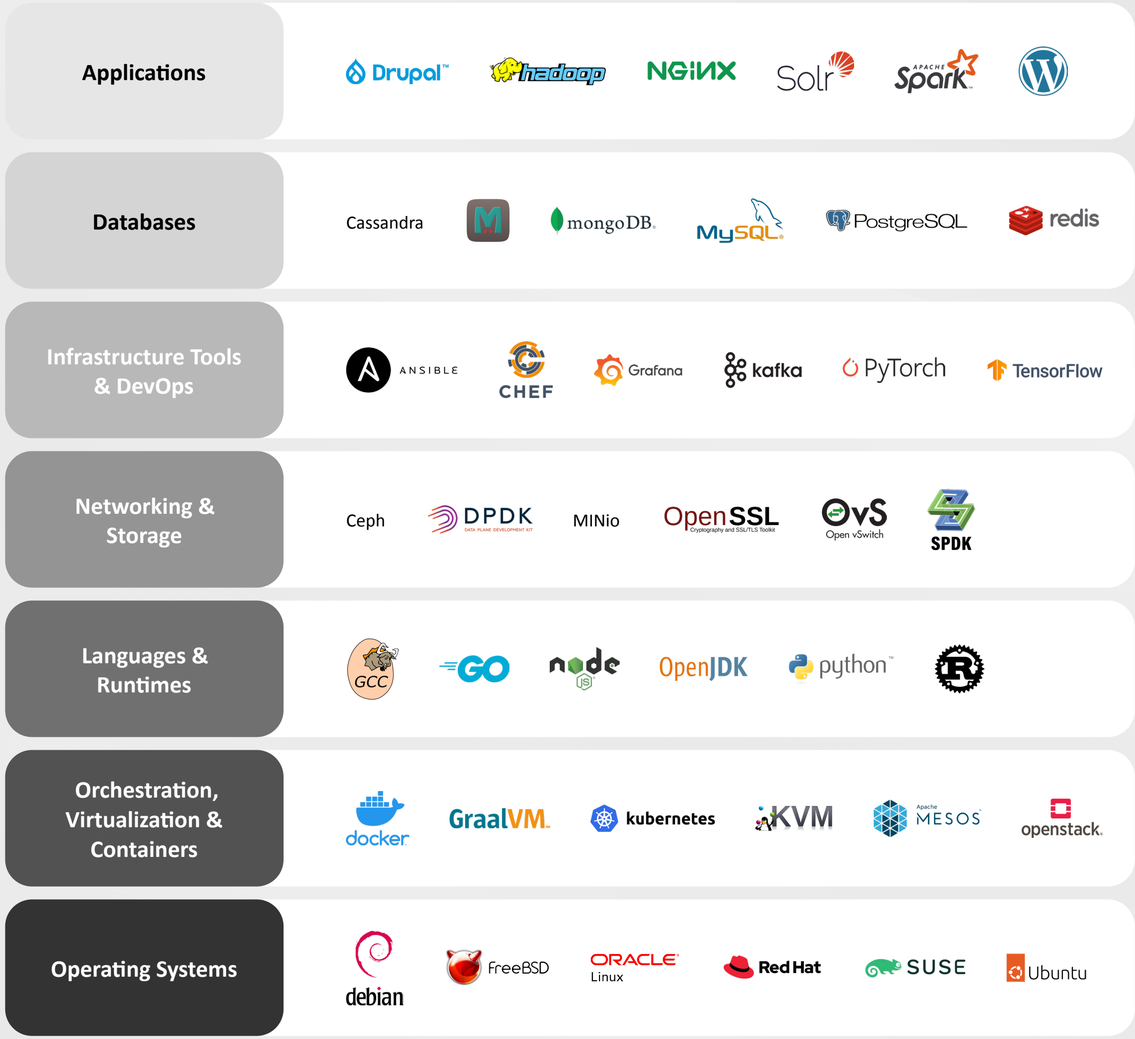
CEO

Simple path to improved efficiency in your data center

Designed and supported to shorten time to deployment

Cloud Native Processors are designed with architecture transitions in mind and prioritize maintainability, performance, and portability—allowing data center operators to focus on their customers and products.

Hundreds of packages and images support the cloud native architecture today, and the software ecosystem is growing.



Plesk/WebPros deploys a new Ampere architecture in 6 weeks

“From initial exploration to public beta, our engineering team was able to create a POC running on OCI Ampere A1 within six weeks.”

Lukas Hertig

plesk

Senior Vice President of Business Development & Strategic Alliances

Ampere family of Cloud Native Processors

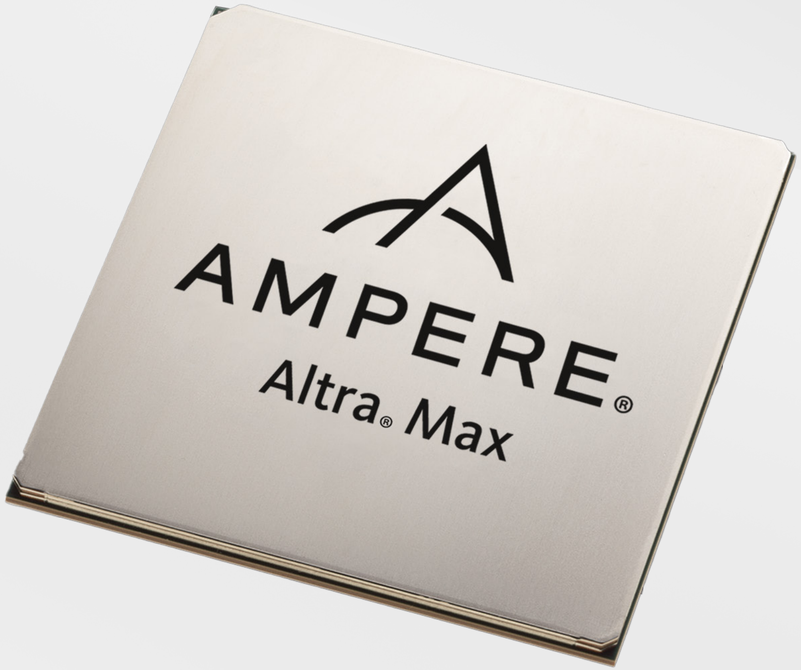
07

Cloud Native Processors with sustainability at the core

Ampere Altra Family of Processors

The world's first Cloud Native Processors—and only 128-Core processors—are designed for general purpose data center applications running on cloud Infrastructures.

Ampere Cloud Native Processors deliver 3x the performance while consuming 2.8x less power. Unique cloud cores and architectural features deliver unparalleled levels of cloud performance, scalability, and efficiency.



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Momento realizes increased performance with Ampere

“We are particularly excited about the cost and performance of Ampere Arm-based VMs. Processor innovation is happening faster than ever, and the user experience of porting existing software is easier than ever. The investment required to validate new architecture just isn’t as high as it used to be—and the upside is meaningfully larger.”

Khawaja Shams

momento

Co-founder & CEO

Data centers do more for less with Ampere processors

Deploying Cloud Native Processors is not only smart, but also the socially responsible choice for cloud computing of the future.

2.5x

greater performance per rack

2.8x

lower energy consumption

3x

reduced data center footprint

$31.5M

in savings

Get more insights into data center efficiency

Learn more

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Ampere Computing

Ampere is a modern semiconductor company designing the future of cloud computing with the world's first Cloud Native Processors.

Built for the sustainable Cloud, Ampere products deliver the highest performance per watt and per rack–accelerating the delivery of all cloud computing applications.
Ampere Cloud Native Processors provide industry-leading cloud performance, power efficiency, and scalability.

AMPERE®